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ABSTRACT

This volume presents a summary of the methods, findings and recommendations for federal policy of the National Day Care Study (NDCS), a 4-year study of the effects of regulatable day care center characteristics on the quality and cost of day care for preschoolers. Chapter I describes current day care services and the history of federal involvement to the present. Chapter II presents the major policy issues addressed by the NDCS and its conceptual framework and research design. Chapter III explains the sampling procedure of the NDCS. Chapter IV deals with those aspects of day care centers which are susceptible to federal regulation and hence most affected by federal policy decisions, and with alternative measures of policy variables. Chapter V discusses the conceptual and instrumental problems of defining "quality care" and gives the study's definition. Chapters VI and VII present the NDCS findings. In Chapter VI the relation between regulatable aspects of day care and quality of care, the generality of the findings, and the connection between research findings and policy decisions are explored. In Chapter VII the issue of cost versus quality is examined. Chapter VIII discusses current regulatory policy and recommends alternative regulatory policies. A "Commentary" is appended which presents the views of minority consultants on issues with crucial effects for minority children. Three appendices provide: (1) a summary of the findings of the NDCS Supply Study, (2) an overview of the Infant/Toddler Study, and (3) the names of all NDCS staff and consultants. (Author/BH)

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Final Report of the National Day Care Study
VOLUME I

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CHILDREN AT THE CENTER

SUMMARY FINDINGS AND THEIR IMPLICATIONS

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OVERVIEW OF NDCS FINAL REPORT VOLUMES

Results of the National Day Care Study and its two major supporting studies, The National Day Care Supply Study and the National Infant/Toddler Day Care Study, are presented in a five-volume final report. Contents of these volumes are as follows.

Volume I

Children at the Center: Summary Findings and Policy Implications of the National Day Care Study presents in summary form the major findings and implications for federal day care policy of the National Day Care Study, a four-year study of the effects of regulatable center characteristics on the quality and cost of day care for preschoolers. Volume I serves both as a self-contained volume for the policymaker and as the foundation for the detailed presentation of results in Volumes II, III and IV. (Executive summaries of Supply Study and Infant/Toddler Study findings are included as appendices to Volume I.)

Volume II

Research Results of the National Day Care Study is a companion volume to *Children at the Center.* Volume II documents the analyses and results of the NDCS for the technical reader who seeks a more thorough understanding of the study from a research perspective. Volume II thus provides the quantitative support for the findings and policy conclusions reported in *Children at the Center.*

Volume III

Day Care Centers in the U.S.: A National Profile 1976-1977, the final report of the National Day Care Supply Study, is based on data gathered from a national random sample of over 3000 day care centers, stratified by state. Summary information is presented on characteristics of children and families served, center programs, staff, finances and regulatory compliance. Discussion of results is augmented by over 150 statistical tables.

Volume IV

Technical Appendices to the National Day Care Study is a compendium of technical papers supporting the most important conclusions of the study. These papers form the basis for the summaries in Volumes I and II. NDCS appendices are bound in four sections as follows.

Volume IV-A, *National Day Care Study Background Materials,* contains three papers, each of which establishes a distinctive context for the NDCS: a literature review focused on effects of group care and regulatable characteristics of the day care environment; case studies of the history and current practice of day care in the three NDCS sites (Atlanta, Detroit, Seattle); and a review of child development issues relevant to the NDCS from the perspective of black social scientists.

Volume IV-B, *National Day Care Study Measurement and Methods,* presents individual reports on a series of technical tasks supporting the principal analyses of the effects of key center characteristics on children. Among the topics covered are: variance components analysis of the dependability of observation and test measures; analysis of alternative measures of classroom composition; psychometric analysis of the NDCS test battery; and analyses of several other more peripheral instruments used in the study. A detailed report on site and sample selection and the issue of generalizability concludes the volume.

Volume IV-C, *National Day Care Study Effects Analyses,* also a series of individual technical reports, begins with a presentation of the major effects analyses based on the two behavioral observation instruments, and then moves to a detailed treatment of the development and use of adjusted test score gains. The links among caregiver and child behavior, child test scores and other dependent measures are explored. Also detailed are results of the Atlanta Public School (APS) controlled substudy and the APS replication substudy. Results of a special survey of parents of subsidized children taken during Phase III are presented, as are the results of analysis of the impact on children of other center characteristics, such as physical space and program orientation.

Volume IV-D, *Center Day Care for Infants and Toddlers: An Exploratory Policy Study,* is the final report of the second major supporting study of the NDCS. It presents a profile of national and regional day care for children from birth to three years, based on a nationally representative sample survey of 1500 centers. The study also provides an analysis of selected center characteristics and classroom processes, based on in-person interviews with staff and parents, as well as systematic classroom observations, in a 54-center subsample.

Volume V

National Day Care Study Documentation and Data gives a brief overview of NDCS data collection instruments and data files. Part A consists of the instruments themselves, including interview and data collection forms, observation systems and cognitive tests. Part B consists of data dictionaries; these describe every variable in the NDCS analytic data files. Part C provides codebooks for the data files. Parts B and C are available on computer tapes, which are readable independent of specific computer systems. Note that computer tapes are available only from Abt Associates.

Copies of the final report may be ordered from:

- EXECUTIVE SUMMARY (ONLY)
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National Day Care Study First Annual Report, Volume I: An Overview of the Study [order number ED 131 928], *Volume II: Phase II Design* [order number ED 131 929], and *Volume III: Information Management and Data Collection Systems* [order number ED 131 930] (Cambridge, MA: Abt Associates, 1976).

National Day Care Study Second Annual Report [order number ED 147 016] (Cambridge, MA: Abt Associates, 1977).

National Day Care Study Preliminary Findings and their Implications [order number ED 152 114] (Cambridge, MA: Abt Associates, 1978).

DEDICATION

To the staff, parents and most particularly the children of the sixty-four study centers in Atlanta, Detroit and Seattle. Their participation has permitted new and important policy insights into the issues of quality and cost in center day care.

TABLE OF CONTENTS

Page

LIST OF TABLES XI

LIST OF FIGURES XII

GLOSSARY XV

FOREWORD XXIII

PREFACE XXV

ACKNOWLEDGMENTS XXXI

EXECUTIVE SUMMARY XXXV

CHAPTER ONE: INTRODUCTION 1
- Day Care 1978: Needs and Responses 1
- Current Federal Involvement in Day Care 3
- History of Federal Involvement in Day Care 5
- Federal Regulation of Day Care 6
- Prior and Concurrent Day Care Research 8

CHAPTER TWO: OBJECTIVES AND DESIGN OF THE NATIONAL DAY CARE STUDY 11
- Policy Focus of the NDCS 11
  - Major Policy Questions 13
  - Study Focus: Policy Variables 13
- Study Design: Conceptual Framework 14
- Study Implementation 16
  - Phase I 18
  - Phase II 18
  - Phase III 20
- Study Review: Consultant Panel 22

CHAPTER THREE: THE NATIONAL DAY CARE STUDY SAMPLE 23
- Selection of the Universe of Centers 23
- Selection and Description of Sites 24
  - Selection of Sites 24
  - Description of Sites 26
- Selection and Description of Centers 29
  - Selection of Centers at the NDCS Sites 29
  - Description of Phase III Centers 29
- Description of Target Children and Families 36
- Evaluation of the Sample 36
  - Power to Detect Effects 37
  - Representativeness of the Sample 40

6

CHAPTER FOUR: THE POLICY VARIABLES 43
  Data Sources and Criteria for Selection of Measures 43
  Measurement of the Classroom Composition Variables 45
    Conceptual Analysis 45
    Measurement Issues 47
      Data Sources: Observations versus Schedules 47
      Fluctuations of Classroom Composition over Time 50
      Reliability and Validity of Classroom Composition Measures 51
    Implications for Monitoring 52
      Data Sources: Observations versus Schedules 52
      Fluctuation in Classroom Composition over Time 53
      Reliability and Validity of Classroom Composition Measures 53
  Measurement of the Caregiver Qualifications Variables 54
    Years of Education 55
    Child-Related Education/Training 55
    Experience 55
    Reliability and Validity of Qualifications Measures 56
  Measurement of Other Regulatable Center Characteristics 56
    Center Philosophy and Program Orientation 57
    Physical Environment 58
    Variables not Included in Cost or Effects Analyses 59

CHAPTER FIVE: IN SEARCH OF QUALITY 61
  Perspectives on Defining Quality in Child Care 61
  Perspectives on Measuring Quality in Day Care 64
  Variables and Instruments 66
    Adult Observation Variables and Instruments 66
    Child Observation Variables and Instruments 68
    Standardized Tests 70
    Other Dependent Variables and Instruments 72
  Summary: NDCS Effects Measures and Quality in Child Care 75

CHAPTER SIX: LINKS BETWEEN POLICY VARIABLES AND MEASURES OF QUALITY 77
  Overview of Findings 77
  A Context for NDCS Findings 79
    Association, Causality and Policy Interpretation 79
    Policy Significance and Magnitudes of Relationships 80
  Data Sources and Analyses 83
  Effects of Classroom Composition 84
    Classroom Composition and Lead Teacher Behavior 85
    Classroom Composition and Child Behavior 88

- Classroom Composition and Gains on the PSI and PPVT 90
- Group Size and Activity Subgroups 95
- Effects of Caregiver Qualifications 98
  - Relationship between Formal Education and Child-Related Specialization 101
  - Interchangeability of Education, Experience and Training 101
- Interactions between Classroom Composition and Caregiver Qualifications 102
- Links Between Behavior and Test Scores 102
- Effects of Other Center Characteristics 104
- Generality of Effects Findings 105
- Conclusions 107

CHAPTER SEVEN: LINKS BETWEEN POLICY VARIABLES AND MEASURES OF COST 111

- Overview of Findings 111
- A Context for NDCS Cost Findings 112
- The NDCS Research Cost Accounting System 114
- Classification of NDCS Centers for Policy Analysis 115
- Cost Structure of NDCS Centers and Comparison with Centers Nationally 118
- Relating Program Characteristics to Center Types 122
- Relating Program Characteristics to Costs 125
  - Caregiver/Child Ratio 126
  - Noncaregiving Staff 128
  - Caregiver Qualifications and Wage Rates 128
  - Group Size 132
- Relating Costs, Center Types and Program Characteristics 133
- Simulation of the Impact of Alternative Group Composition Requirements 134

CHAPTER EIGHT: IMPLICATIONS FOR REGULATIONS AND ADMINISTRATIVE PRACTICES 137

- Classroom Composition 139
  - Current Regulatory Policy 139
  - Regulatory Options for Preschool Children 140
  - Evaluation of the Three Classroom Composition Policy Options for Preschool Children 148
    - Quality of Care for Individual Children 148
    - Day Care Costs 152
    - Quality and Cost Trade-offs 153
    - Other Considerations 154
  - Regulatory Recommendations for Children Under Three 158
- Caregiver Qualifications 160
- Other Regulatable Center Characteristics 164

Regulatory Language and Monitoring Guidelines 163
  Regulatory Language 165
  Monitoring Guidelines 168
Appropriations, Funding and Rate-Setting 176

COMMENTARY: THE NATIONAL DAY CARE STUDY FROM THE PERSPECTIVE OF BLACK SOCIAL SCIENTISTS 181
Formation and Function of the Task Force 181
The Minority Review Process 182
Major Concerns of the Black Task Force 182
  Conceptual Framework 183
  Design and Implementation 184
    Cognitive Measures 185
    Observation Instruments 187
  Analysis of Study Findings 188
Conclusions/Recommendations 189

APPENDIX A: THE NATIONAL DAY CARE CENTER SUPPLY STUDY 193

APPENDIX B: THE INFANT/TODDLER DAY CARE STUDY 251

APPENDIX C: NDCS CONSULTANTS, ACYF STAFF AND CONSULTANTS, AND ABT ASSOCIATES STAFF 275

NOTES 281

LIST OF TABLES

Page

CHAPTER THREE: THE NATIONAL DAY CARE STUDY SAMPLE

Table 3.1 Distribution of Center-Level Averages of Classroom Composition Variables 30
Table 3.2 Distribution of Center-Level Averages of Caregiver Qualifications Variables 35
Table 3.3 NDCS Centers: Summary Data 35
Table 3.4 Correlations Among the Major Policy Variables 38
Table 3.5 Correlations Among Policy and Background Variables 39

CHAPTER SEVEN: LINKS BETWEEN POLICY VARIABLES AND MEASURES OF COST

Table 7.1 Distribution of Centers by Legal Status 116
Table 7.2 Sources of Center Income 117
Table 7.3 Allocation of Monthly NDCS Resource Costs Per Full-Time-Equivalent Child by Center Type 119
Table 7.4 Allocation of Monthly Resource Costs by Center Type in NDCS and Supply Study On-Site Centers 121
Table 7.5 Classroom Composition and Caregiver Qualifications by Center Type 123
Table 7.6 Percent of Centers Providing Selected Supplemental Services by Center Type 124
Table 7.7 Illustrative Trade-off Analysis: Ratio versus Wage Rates versus Number of Children Served for Each $100 Million Expended 132

CHAPTER EIGHT: IMPLICATIONS FOR REGULATIONS AND ADMINISTRATIVE PRACTICES

Table 8.1 Group Size and Staff/Child Ratio Requirements 140
Table 8.2 Cross-State Comparisons of Staff/Child Ratios and Degree of Regulatory Compliance 157
Table 8.3 Comparison of Estimated Quality, Cost and Market Implications of Alternative Preschool Classroom Composition Regulations 159
Table 8.4 Attendance- and Enrollment-Based Regulations for Staff/Child Ratio and Group Size 168

LIST OF FIGURES

Page

CHAPTER TWO: OBJECTIVES AND DESIGN OF THE NATIONAL DAY CARE STUDY

Figure 2.1 Conceptual Model of Center Day Care 15
Figure 2.2 National Day Care Study Design and Implementation 17
Figure 2.3 Design of the Phase II Natural Study 19
Figure 2.4 Design of the 49-Center Quasi-Experiment 20
Figure 2.5 Design of the Atlanta Public Schools (APS) Eight-Center Experiment 21

CHAPTER THREE: THE NATIONAL DAY CARE STUDY SAMPLE

Figure 3.1 Distribution of Classroom Composition Measures (Observed) for the NDCS and Nationally 31
Figure 3.2 Distribution of Caregiver Qualifications Measures: Education and Training Variables for the NDCS and Nationally 32
Figure 3.3 Distribution of Caregiver Qualifications Measures: Experience Variables for the NDCS and Nationally 34

CHAPTER SIX: LINKS BETWEEN POLICY VARIABLES AND MEASURES OF QUALITY

Figure 6.1 The Relationship Between Lead Teacher Behavior and Group Size 87
Figure 6.2 The Relationship Between Lead Teacher Behavior and Staff/Child Ratio 88-89
Figure 6.3 The Relationship Between Child Behavior and Group Size 91-92
Figure 6.4 The Relationship Between Child Test Score Gains and Group Size 94
Figure 6.5 The Relationship Between Lead Teacher Interaction with Small Activity Subgroups and Group Size 96
Figure 6.6 The Relationship Between Object of Child's Attention and Group Size 97
Figure 6.7 The Relationship Between Lead Teacher Behavior and Lead Teacher Child-Related Education/Training 99
Figure 6.8 The Relationship Between Child PSI Gains and Classroom Staff Child-Related Education/Training (Center Average) 100

CHAPTER SEVEN: LINKS BETWEEN POLICY VARIABLES AND MEASURES OF COST

Figure 7.1 Distribution of NDCS Centers by the Percentage of Center Income Derived from Parent Fees 117
Figure 7.2 The Impact of Staff/Child Ratio on Monthly Cost per FTE Child 127

Figure 7.3 Distribution of Caregiver Wage Rates, 1977 130
Figure 7.4 The Impact of Staff/Child Ratio and Wage Rates on Monthly Cost per FTE Child 131

CHAPTER EIGHT: IMPLICATIONS FOR REGULATIONS AND ADMINISTRATIVE PRACTICES

Figure 8.1 Impact of Alternative Preschool Classroom Composition Policies on Caregiver and Child Behavior and Test Score Gains 150
Figure 8.2 Worksheet for Determination of Compliance with Staff/Child Ratio Requirements on a Daily Basis 175

GLOSSARY

This glossary is intended as an aid to the reader. It is not an exhaustive dictionary of terminology relevant to the study or practice of day care, but rather a list of terms used throughout *Children at the Center* which may be unfamiliar to the reader or which have special meanings for the purposes of the National Day Care Study.

An alphabetical list of terms enables the reader to find any item easily; numbers refer to the location of the term in the glossary itself, which is arranged by subject area to facilitate understanding of terms in relation to each other and in the context of this study. Subject areas are:

Classification of Day Care Services
Children and Staff
Classification of Day Care Centers
NDCS Independent Variables
NDCS Dependent Variables
Statistical Terminology

Alphabetical List of Terms

activity subgroup [42]
aide [17]
auspices [21, 25]
background variable [46]
caregiver [13]
caregiver/child ratio [44]
caregiver qualifications [45]
child outcome [51]
classroom composition [38]
classroom process [49]
core care [8]
correlation [59]
cost variables [54]
day care [1]
day care center [2]
dependent variable [47]
developmental outcomes [52]
effects [48]
family day care home [3]
FFP center [34]
full-time day care [6]
funding source [30, 33]
generalizability of a measure [57]
generalizability of a sample [58]
group center [23]
group day care home [4]
group size [41]
independent center [22, 26]
independent variable [36]
infant [12]
in-home day care [5]
lead caregiver [16]
lead teacher [15]
legal status [19]
multiple regression [61]
non-FFP center [35]
nonprofit center [24]
number of caregivers [39]
outcome [53]
parent-fee center [31]
part-time day care [7]
policy variable [37]
preschooler [10]
principal components analysis [62]
private center [28]
process [50]
profit center [20]
provider [18]

public center [29]
publicly funded center [32]
regression [60]
reliability [56]
sponsored center [27]
staff [14]
staff/child ratio [43]
staffing pattern [40]
supplemental services [9]
toddler [11]
validity [55]

Classification of Day Care Services

Day Care [1] is defined as care provided to a child by a person or persons outside the child's immediate family, either inside or outside the child's home.

- **A day care center** [2] is defined as a licensed facility in which care is provided to 13 or more children under the age of 13, generally for up to 12 hours each day, five or more days each week, on a year-round basis.
- The term **family day care home** [3] refers to a private family home, generally not licensed, in which children receive care, usually for up to 12 hours each day, five or more days each week, on a year-round basis. Most state licensing codes limit family day care homes to a maximum of six children.
- **A group day care home** [4] is defined as a private home serving 7 to 13 children, with one or two adults.
- **In-home day care** [5] is defined as care provided to a child in the child's own home by a nonrelative or by a relative who is not a member of the child's immediate family.

Day care of any of these types may be either full-time or part-time.

- **Full-time day care** [6] is defined as care for 30 or more hours per week.
- **Part-time day care** [7] is defined as care for less than 30 hours per week.

The services provided by a day care center may be classified into two blocks.

- **Core care** [8] refers to the common components of the daily experience of all children in day care centers. Core care includes provision of meals, snacks, space and educational/play materials, arrangements for minimum health care, and various caregiver services necessary to the nurturance of young children.

- **Supplemental services** [9] are those services to children and their families provided by a day care center in addition to core care. For children, such services include transportation, diagnostic testing and referrals. For parents, examples are social, welfare and employment services, and parent involvement in advisory and decisionmaking capacities. Supplemental services often address fundamental needs; the term "supplemental" merely reflects the fact that they are outside the scope of a minimal center day care program.

Children and Staff

The following terms are applied to children and adults in day care settings.

- **Preschoolers** [10] are defined as children three, four and five years of age (36-71 months). In some states most five-year-olds attend kindergarten and thus are considered school-aged children. In these cases, preschoolers are predominantly 36 through 59 months of age.
- **Toddlers** [11] are defined as children aged 18 through 35 months of age.
- **Infants** [12] are defined as children from birth through 17 months of age.
- A **caregiver** [13] is a person who provides direct care to children in a day care center classroom, a family day care home, or in a child's own home. Unless otherwise specified, the terms **caregiver** and **staff** [14] are interchangeable in NDCS documents.
- A **lead teacher** [15] (or **lead caregiver** [16]) is the principally responsible caregiver in a day care classroom. The term "teacher" is not intended to connote a school-like atmosphere in the day care center. The term **caregiver** has been used to refer to persons working with children in day care settings, and the term **lead teacher** is sometimes used to distinguish the principally responsible caregiver in a day care classroom from her aides.
- An **aide** [17] is a caregiver who assists a lead teacher in a day care classroom.
- A day care **provider** [18] is a person who is directly or indirectly involved in the provision of day care services; including caregivers, center directors and owners.

Classification of Day Care Centers

Day care centers are classified according to **legal status** [19] as profit or nonprofit.

- **Profit centers** [20] are further classified according to **auspices** [21] as independent centers or group centers.
  - **Independent centers** [22] are not part of a chain of day care centers.
  - **Group centers** [23] belong to a chain (group) of day care centers.
- **Nonprofit centers** [24] are classified according to **auspices** [25] as independent centers or sponsored centers.
  - **Independent centers** [26] are not sponsored by any group or agency.
  - **Sponsored centers** [27] are classified as either private or public, according to the nature of the sponsoring agency.
    - **Private centers** [28] are sponsored by a private agency, such as a church. (Note that all profitmaking centers, as well as independent nonprofit centers, are necessarily private.)
    - **Public centers** [29] are sponsored by some government agency, such as a city school system or a county welfare department.

In addition to classification by legal status and auspices, day care centers may be classified by a cross-cutting typology according to **funding source.** [30]

- **Parent-fee centers** [31] derive more than half of their income from parent fees.
- **Publicly funded centers** [32] derive their funding principally from government subsidies and gifts and contributions.

Alternatively, centers may be classified by **funding source** [33] according to federal financial participation (FFP). This typology was used in Supply Study analyses, and the reader may find these terms used when Supply Study data are referred to.

- An **FFP center** [34] is defined as any center which serves one or more federally subsidized child(ren).
- A **non-FFP center** [35] is defined as a center which serves no federally subsidized children.

NDCS Independent Variables

NDCS **independent variables** [36] are those variables whose costs and effects were to be measured. There are two types of independent variables: policy variables and background variables.

- **Policy variables** [37] are those characteristics of day care centers which may influence the quality and cost of center day care and which are or can be affected by federal policy. The NDCS was concerned with two major classes of policy variables: classroom composition and caregiver qualifications:
  - **Classroom composition** [38] describes configurations of caregivers and children in day care classrooms. Classroom composition is defined by three variables. (Note that any two of these variables mathematically define the third.)
    - **Number of caregivers** [39] is defined as the total number of caregivers assigned to each classroom. (The term **staffing pattern** [40] may refer not only to the number of caregivers assigned to a classroom, but also to the mix of teachers and aides or to the mix of qualifications of the caregivers in a classroom.)
    - **Group size** [41] is defined as the total number of children assigned to a caregiver or team of caregivers. In most cases, groups occupied individual classrooms or well-defined physical spaces within larger rooms. In a few "open classroom" centers, children were free to move from group to group. In such cases, clusters of children participating in common activities under the supervision of the same caregiver or team of caregivers were considered to be "groups." (The term **activity subgroup** [42], by contrast, refers to the actual number of children interacting with a particular caregiver. A group of 20 children, for instance, might be divided into three activity subgroups, one with the lead teacher, and two with aides.)
    - **Staff/child ratio** [43] is defined as **number of caregivers** divided by **group size**. Higher, or more stringent, staff/child ratios are those with a smaller number of children per adult. For instance, a ratio of 1:5 is higher, or more stringent, than a ratio of 1:10 (which is lower, or less stringent). Note that the terms **staff/child ratio** and **caregiver/child ratio** [44] are interchangeable in NDCS discussions.
  - **Caregiver qualifications** [45] variables were developed to describe caregivers' years of formal education, amount of

training and/or education related to child development, and amount of work experience as a caregiver.

- **Background variables** [46] are characteristics of day care centers which can be influenced by government regulation only indirectly, if at all. Examples are age, sex and race of children, or socioeconomic characteristics of families and of the community served by a center.

NDCS Dependent Variables

NDCS **dependent variables** [47] are those features of day care costs and quality measured as indicators of the effects of such center characteristics as group size, staff/child ratio and caregiver qualifications (the study's independent variables).

- In NDCS discussions, the term **effects** [48] is often used to distinguish dependent variables pertaining to quality in day care from dependent variables pertaining to day care costs. There are two major classes of effects variables.
  - The term **classroom process** [49] (or **process** [50]) refers to the behavior of children and caregivers in the classroom; that is, the dynamics of their interaction. Process was recorded using two observation instruments, one concentrating on children's behaviors (the Child-Focus Instrument) and one concentrating on caregivers' behaviors (the Adult-Focus Instrument).
  - The term **child outcomes** [51] (or **developmental outcomes** [52], or **outcomes** [53]) refers to children's gains in school-readiness skills; although a number of tests and ratings of social and cognitive development were field-tested, ultimately only two, both standardized cognitive tests, proved reliable enough to be used as outcome measures: the Preschool Inventory (PSI) and the Peabody Picture Vocabulary Test (PPVT).
- **Cost variables** [54] correspond in the main to commonly used terminology in accounting and economics. Where terms or variables peculiar to the NDCS are introduced, they are explained in the text.

Statistical Terminology

- The **validity** [55] of a measure is the degree to which it measures what it purports to measure. Various features of a measure may be indicative of its validity; such as: (1) a direct conceptual relationship between the measure and the construct of interest (e.g., between an observer's count of the number of children present in a class and the variable **group size**); or (2) agreement with other measures of the same construct (e.g., agreement between observation-based measurements of **group size** and schedule-based measurements of **group size**).

- The **reliability** [56] of a measure is the degree to which it gives consistent results when applied in a variety of situations; that is, the degree to which it is free of measurement error. Reliability coefficients vary from 0.00 to 1.00. A coefficient of 0.00 indicates a completely unreliable measure; a coefficient of 1.00 indicates a measure that gives perfectly consistent results across all situations. Thus, a reliability coefficient of .95 indicates that 95 percent of the measured variation among the objects of measurement (e.g., among children) is attributable to genuine differences among the objects of measurement, and that only 5 percent of the variation measured is attributable to random effects of errors of measurement.
- The **generalizability of a measure** [57] is a sophisticated extension of the concept of reliability in psychological measurement theory. It incorporates the notion that the numerous sources of variation in measurement grouped as "measurement error" according to standard reliability theory *may or may not be defined as "error,"* depending on one's purpose in using a given measure. [The concept of generalizability is a very complex one which cannot be clearly presented in the limited space available here. For a definitive treatment of the subject, the reader is referred to L. Cronbach, G. Gleser, H. Nanda, and N. Rajaratnam, *The Dependability of Behavioral Measurements: Theory of Generalizability for Scores and Profiles* (New York: John Wiley & Sons, Inc., 1972).]
- The **generalizability of a sample** [58] is the degree to which the sample accurately represents a universe to which findings based on the sample are to be extended.
- The **correlation** [59] (degree of association) between two variables is represented by a correlation coefficient expressed as a decimal fraction. Correlation coefficients range from +1.00 (representing a perfect positive correlation) through zero (representing the absence of any correlation) to −1.00 (representing a perfect negative correlation). For example, a positive correlation between children's scores on Tests A and B would mean that children with high (or, low) scores on Test A also tend to have high (or, low) scores on Test B. If the two tests' scores were negatively correlated, then high scores on Test A would tend to be associated with low scores on Test B, and vice versa.

- **Regression** [60] analysis is a technique for extracting from data an idealized representation, in the form of a straight line, of the relationship between two variables. That is, regression defines the particular straight line which is the "best" linear approximation of the less clearcut pattern exhibited in the data. Similarly, **multiple regression** [61] analysis extracts an idealized representation of the relationships between a given dependent variable and two or more independent variables.
- **Principal components analysis** [62] produced alternative weighted combinations of variables ("principal components"), thus allowing the researcher to select a small number of components which convey most of the important information in a data set – that is, which together account for a large proportion of the variance in the data. For example, a large number of variables related to socioeconomic status might be reduced to a few components – clusters of variables which are highly correlated with one another and only weakly related to variables in other components.

FOREWORD

A child never stops developing. Inexorably drawn toward the pleasure of learning, young children reach out to capture all the "raw resources" (including adults) that are available to them. Using whatever is there, they move forward each week, sometimes each day, to improve some new skill, to add some new understanding of their universe.

The great wisdom of the day care community – parents, providers, specialists – has been to recognize this as a fact and to act upon it.

The final report of the National Day Care Study (NDCS) supports this wisdom. And by underpinning it with a careful, strong research base, this study can only augment further the knowledge and the commitment of the day care community.

The need for sound research data about the world of day care was widely recognized in 1974, when the Administration for Children, Youth and Families commissioned the National Day Care Study. In 1979, that need is even more urgent. During the past five years, the number of children in day care arrangements has increased significantly; children are beginning day care at an earlier age; and both parental needs for and government support of day care services are growing.

It is with great pride and satisfaction that this agency presents the Final Report of the National Day Care Study. The findings and conclusions presented in this first volume – *Children at the Center* – summarize research results on the benefits and the costs of critical center day care characteristics for preschool children.

The NDCS was regularly reviewed over the four-year effort by experts in day care and related fields to insure the study's objectivity and technical integrity. In addition, this agency and the study's two contractors – Abt Associates Inc. and SRI International – have sought to identify and incorporate the special concerns of minorities, parents and day care providers in the research process. I would like to extend special thanks to the head of the ACYF Day Care Division, Preston Bruce, and to Allen Smith, the study's project officer, for the many hours of effort which they have given to the study.

Although this first volume will be of interest and benefit to all segments of the day care community, the Federal Government will make first use of NDCS findings. Policymakers now have a research base on which to shape programs of day care center support and regulation for the 1980's.

Admittedly, research data alone cannot resolve the major issues surrounding Federal support and regulation of day care. However, I believe that the analyses and research results in this volume are a major milestone in the formulation of responsible social policy as we strive to be supportive of families involved in the most important enterprise of our society – the nurturance of children and youth.

Blandina Cardenas Ramirez
Commissioner, Administration for
Children, Youth and Families

March, 1979

22

PREFACE

In recent years the federal government's role as a purchaser of child care has expanded. With this expansion, increasing public and governmental attention and debate have focused on the quality of care purchased with federal dollars. The Federal Interagency Day Care Requirements (FIDCR), first established in 1968, were a direct response to this concern for quality. Designed as purchasing standards to both prevent harm and promote development of children in federally subsidized care, the FIDCR cover a wide variety of center characteristics, including groupings of staff and children, staff qualifications and training, suitability and safety of facilities, and center governance.

In 1974, a modified version of the FIDCR was attached to Title XX of the Social Security Act. Under Title XX, states are permitted to spend child care funds only in facilities that meet the FIDCR. Severe financial penalties are to be levied for noncompliance. The impending implementation of the FIDCR in 1975 provoked a storm of controversy, particularly over the FIDCR's strict staff/child ratio requirements, which exceeded the licensing standards set by almost all states. It became clear that implementation of these ratio requirements would have severe cost consequences for providers, states and the federal government. Congress suspended implementation of the ratio requirements – although it prohibited expenditure of federal funds in centers that allowed their staff/child ratios to fall below 1975 levels – and directed the Secretary of Health, Education and Welfare to prepare a report on the appropriateness of the Title XX FIDCR.

Independent of these events, in 1974 the Office of Child Development, now the Administration for Children, Youth and Families (ACYF) initiated the National Day Care Study (NDCS), a large-scale research project designed to investigate the costs and effects associated with variations of regulatable characteristics of center day care – especially caregiver/child ratio, group size and caregiver qualifications. These three characteristics have long been considered key determinants of quality in center care, and all have been critical factors in both state and federal regulations.

It has been widely assumed that controlling the amount of potential staff time available to teach each child (staff/child ratio), the maximum number of children in a group (group size) and some aspect of a caregiver's education, training or experience (qualifications) would both increase the margin of safety provided by adult supervision and enhance interactions between caregivers and children. Other center characteristics, such as the amount and type of space, the qualifications of the director and of staff other than caregivers, the curriculum, supplemental services, and parent involvement have also been assumed to be important contributors to quality.

It was on the basis of these beliefs and the best available evidence that the 1968 FIDCR were developed. However, only limited empirical evidence existed at that time to support these assumptions. Nor were there data to support the assumption that regulatory control over these characteristics would produce similar outcomes for children across the regions, states, cities, sponsoring agencies and socioeconomic groups affected by federal legislation.

Although conventional wisdom in the child care community has often dictated that quality care meeting the developmental needs of children is linked to more expensive programs, the evidence to this effect available to federal policymakers rested on a narrow and shaky information base. Only a little was known about day care costs, less about its effects on children, and even less about the relationship of costs to effects. Thus it was not inconceivable that well-informed federal policy decisions could promote higher quality in subsidized day care at lower costs.

ACYF was very concerned with the issues surrounding this cost-quality controversy. Although the primary legislative rationale for subsidized day care has long been to foster the economic independence of single-parent families, ACYF was strongly committed to the position that the developmental well-being and growth of children can be fostered in the day care setting. The NDCS was implemented to determine whether federal regulations could be developed which would incorporate ACYF's commitment to quality without nullifying the indirect economic benefits which have motivated day care legislation.

The NDCS mandate has been to focus on the cost-effectiveness of alternative types of day care arrangments, a focus clearly relevant to current discussions concerning government day care policy. Research results from the NDCS are intended to provide information essential for a sound reformulation of HEW standards and regulations for programs serving children subsidized with government funds. NDCS results will also enable state and local officials to make decisions regarding public support for day care which take into account both quality and cost dimensions in weighing alternative day care implementation strategies.

The NDCS has now completed its task and has met its mandate.

The most important finding for policy and practice is that traditionally regulated core characteristics – group size and caregiver/child ratio – do have a major impact on important outcomes for children and that specific combinations of these characteristics can achieve better quality care at lower costs.

An important dimension of this finding is that group size and staff/child ratio are, in the real world, inextricably linked. When center directors and regulators set a ratio, they must also set an associated group size *as a multiple of the selected ratio.* A ratio of one caregiver for every five children (1:5) is associated meaningfully with group sizes of 5, 10, 15, 20 and so forth, a ratio of 1:7 with group sizes of 7, 14, 21 and so on.

It is for this reason that the concept of *classroom composition,* which involves *both* group size *and* staff/child ratio, is so important. How classrooms are composed contributes greatly to differences in both quality and cost for each child.

The most powerful element of classroom composition for quality is absolute group size — the total number of children for whom one or more caregivers is responsible; moreover, differences in group size are only slightly related to differences in cost. Smaller groups are better; more desirable caregiver and child behavior and child test scores are predictably found in smaller groups even when staff/child ratio varies within the range of 1:5 to 1:10. In a group of 14 children with two caregivers the mathematical ratio is 1:7, just as the *mathematical* ratio for 28 children and four caregivers is 1:7. The *human* ratio is, for the caregivers involved, twice as much in the second case as the first. *Each* caregiver has 28, not 14, children's names and needs to know.

Just as group size is an important predictor of differences in quality, so is the staff/child ratio dimension of classroom composition the most powerful predictor of differences in the cost of core care (that is, care exclusive of additional important health and social services). Because day care is a labor-intensive service, even minor variations in ratio can account for large variations in the cost per child.

Hence, NDCS findings point towards ways of achieving higher quality at a slightly lower cost per child. Decisions about classroom composition are decisions about group size which affect the quality of care each child potentially will receive; they are also decisions about ratio which ultimately can determine how many children are served or what wages can be paid for a fixed amount of money expended.

It should be clearly understood that NDCS findings do not in any way diminish the importance of staff/child ratio; such a misunderstanding would be a serious error in interpretation. Rather, NDCS findings shift the emphasis from ratio alone to small groups and associated ratios, that is, to *classroom composition,* as the day care characteristic which when regulated can best ensure that children will receive quality care.

It is the central purpose of this first volume of the NDCS final report to explore the findings about the effects of such decisions on children and on costs and the implications of these findings for federal policy, particularly the setting and monitoring of federal day care purchasing regulations. Other findings, particularly the important one concerning staff qualifications – that number of years of education is less important than child-related education/training – are presented at some length.

Because the focus of *Children at the Center* is federal policy, many of the rich data and insights into areas other than those of direct policy relevance could not be presented here. This is the task of the remaining volumes of the NDCS final report (see inside the front cover) which present the research methods and results both of the main cost/effects study and two supporting studies – the study of the national characteristics of day care centers and a limited study of center day care for infants and toddlers.

ORGANIZATION OF CHILDREN AT THE CENTER

The eight chapters of *Children at the Center* may be seen as divided into three groups. Chapters One through Five provide a descriptive context for the study's findings, presented in Chapters Six and Seven. In Chapter Eight, the implications of these findings for federal purchasing regulations is examined.

Chapter One describes the present day care situation, as well as the history and current scope of federal involvement in day care, and presents a brief overview of related research efforts. Chapters Two and Three outline the NDCS itself: Chapter Two presents the major policy issues addressed by the NDCS, the conceptual framework of the study, and the design developed within this framework to address the questions of interest. Chapter Three discusses the process of selecting sites and centers for the NDCS sample, and describes and evaluates the resulting sample. Chapters Four and Five explore major issues involved in developing the study's independent variables and the dependent variables relating to quality of care. Chapter Four deals with the NDCS independent variables – those characteristics of day care centers which are susceptible to regulation and hence most affected by federal policy decisions. The chapter discusses the implications of alternative measures of the policy variables for both the classroom experience and for the monitoring of centers. Chapter Five is a discussion of the complexities of defining and measuring quality in child care. It discusses the variables and instruments which were tested and finally selected, and delineates the NDCS concept of quality care.

Chapters Six and Seven present NDCS findings about the effects of regulatable center characteristics on quality and costs in center day care. Chapter Six is a discussion of the relationships found between NDCS independent variables and the study's measures of quality. It also evaluates the generality of these findings and the relationship between research results and policy decisions. Chapter Seven presents NDCS cost findings – the effects of variations in regulatable center characteristics on the per-child cost of care, and the potential trade-offs between quality and costs indicated by these findings.

Chapter Eight addresses the policy implications of the National Day Care Study findings. It discusses present regulatory policies and presents the regulatory options suggested by NDCS findings. The three most desirable options for regulating classroom composition are evaluated and compared with one another. Regulatory options for caregiver qualifications and other center characteristics are also presented. Finally, NDCS recommendations for wording of regulations, establishing effective monitoring guidelines and relating regulations to funding and rate setting are set forth.

A *Commentary* is appended to these chapters which presents the views of minority consultants to the NDCS on issues with crucial effects for minority children.

Appendix A presents a summary of the findings of the NDCS Supply Study, and Appendix B gives an overview of the Infant/Toddler Study. Finally, the names of all NDCS staff and consultants at both ACYF and Abt Associates are presented in Appendix C.

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ACKNOWLEDGMENTS

Several thousand children; over a thousand parents; hundreds of day care center staff members from Atlanta, Detroit and Seattle; over a hundred advocates, local, state and federal officials; dozens of specialists in the field – all contributed the information on which the National Day Care Study (NDCS) findings about preschool center day care are based.

A full appreciation of the contribution of these people, and of the staff and consultants mentioned below, requires an understanding of the magnitude of the study. Between the summer of 1974 and the fall of 1978 an estimated 100 million bits of data were collected, cleaned, coded and entered on computer tape. These data were examined, combined, and subjected to multiple analyses. The final analytic data set consists of some 8 million separate items in 26 analytic files. In addition, qualitative narrative information gathered from interviews with parents, center staff, advocates and state and local officials was sifted and organized. This information guided analysts seeking to make intelligent and sensitive interpretation of statistical and other numerical output; it also formed the basis for descriptive presentations of day care history and practices as well as parent concerns in each study site.

Ninety person-years – almost 200,000 hours – went into the effort, the equivalent of a long lifetime. Some 55 staff members were involved over the course of the study, 10 at the sites and 45 at Abt Associates' home office in Cambridge. Their names and the role that each played are listed in Appendix C. Here too, numbers can tell only part of the story. Each staff member played a role critical to the success of the study. Special mention should be made of Robert Goodrich, Director of Research, and the core analytic staff: Dennis Affholter, William Bache III, Daniel Calore, David Connell, Nancy Goodrich, Barbara Goodson, Jean Layzer, and Judith Singer.

The NDCS was not only a large undertaking, but also a groundbreaking study in a number of areas; as such, it often taxed the energy and ingenuity of both the professionals and support personnel working on the project. Not everything was done perfectly; but almost everything was done as well as it could be. No project director of a large-scale applied research project could have asked for more commitment from his staff. Those who worked on the NDCS care deeply about children, but also recognized the need to maintain the study's objectivity. Any tendency to drift toward opinion unsupported by fact was rigorously opposed in regular internal dialogues and in discussions with ACYF representatives.

Consultants to the study also helped staff to maintain their objectivity. Twenty-five specialists concerned about day care and

representing diverse perspectives – child development, economics, day care program practice and training, early childhood education, state and federal day care policy, research design and methodology, family policy and advocacy – contributed their talents, their criticism and their support for all or most of the four years (see Appendix C).

Near the close of the study, six additional specialists, not previously associated with the NDCS, were asked to review both the findings and conclusions presented in final report materials. These reviewers were Urie Bronfenbrenner, Alison Clarke-Stewart, James Hefner, Ewart Thomas, Sheldon White and Edward Zigler. Their fresh views were a corrective to excessive claims in some areas and provided support for stronger positions in others. Of course, final responsibility for all technical and editorial decisions rests with the NDCS staff and ACYF.

HEW staff were also supportive of the study. Of special note was the continuing interest and help given by William Prosser of the Office of the Assistant Secretary for Planning and Evaluation and two of his staff, Lucy Conboy and Sonia Conly.

From the Administration for Children, Youth and Families, a number of people deserve thanks. When the study began, William Diepenbrock was Chief of the Day Care Division: Sam Granato followed him, to be followed by Dr. Preston Bruce, current chief. These three men, along with Saul Rosoff, who served as acting Director and Deputy Director of ACYF during the entire course of the study, and Blandina Cardinez Ramirez, current Commissioner – have been stauch and active supporters of the study in many concrete ways. In addition, three HEW consultants to the government project director also provided valuable assistance: Robert Brennan, Victor Cicirelli and Marvin Cline.

It is a rare event for a government project director to be as dedicated to quality and so knowledgeable in policy research as Allen Smith, government project director for the NDCS, has been. Ably assisted by Carol Spence, he was critical to the success of the study. In the early 1970's he designed the research strategy needed to address crucial policy questions. He prepared the RFP in 1974 and has devoted most of his time and energy and all of his exceptional analytic and conceptual skill to the NDCS since its inception. Policymakers, researchers and advocates for children owe a special debt to this man.

Special acknowledgment must be made of the staff who worked on this summary report. The NDCS has been a collegial effort. The foundation for this summary volume rests on prior supporting work by all of the staff. But its writing and rewriting finally came down to a smaller group of people. The first four chapters were the responsibility of Richard Ruopp, supported by Judith Singer, Sally Weiss and Carol O'Neil. The critical findings and implications chapters were the work of three senior staff members: Jeffrey Travers, Associate Project Director, wrote Chapters Five and Six on the measures of quality and the effects of center care on children: Frederic Glantz, Director of the Cost Study, wrote Chapter Seven on center costs; and Craig Coelen, Director of the Supply Study, wrote Chapter Eight on the policy implications of study findings. Arthur Mathis and Ricardo Millett developed the *Commentary* on the NDCS from the perspective of black social scientists (which follows Chapter Eight). It was reviewed and final revisions made in response to recommendations by members of the Black Task Force of the NDCS consultant group to produce a joint minority staff/consultant statement about the NDCS. The last writing effort was the Executive Summary. Gwen Morgan skillfully developed the initial draft and it was revised and edited by the senior staff and Allen Smith.

Appendix A, a summary of the Supply Study, was written by Craig Coelen, and is drawn directly from Chapters Two and Three of *Day Care Centers in the U.S.: A National Profile 1976-1977* (Volume III of the NDCS final report). Appendix B, a summary of the Infant/Toddler Study, is the work of its director, David Connell, and his colleagues Barbara Goodson and Jean Layzer. It is substantially the first chapter of *Center Day Care for Infants and Toddlers: An Exploratory Policy Study* (Volume IV-D of the NDCS final report).

The final word of thanks is appropriately reserved for Nancy Irwin, who made important contributions as style and production editor, and most particularly Christine Bornas, study secretary, and Karen Hudson, Barbara Shank and Annie Hondrogen, who joined her in typing an estimated 10,000 pages of drafts and redrafts of the five final report volumes.

Richard R. Ruopp
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Cambridge, Massachusetts
December 1978

EXECUTIVE SUMMARY: THE NATIONAL DAY CARE STUDY

SUMMARY OF FINDINGS AND POLICY RECOMMENDATIONS

The National Day Care Study (NDCS) investigated quality and cost in center-based day care for preschool children and, to a lesser extent, for infants and toddlers. The NDCS found that higher quality care is associated with two low-cost ingredients – smaller groups of children, and caregivers having child-specific education/training. By itself, the number of classroom staff per group (caregiver/child ratio) was not an important contributor to quality within the policy-relevant range of 1:5 to 1:10. Ratio was, however, strongly related to differences in cost. **The study concludes that revision of current federal day care regulations could allow the government to buy better care at slightly lower cost – meaning that more children would be better served within current budgets.**

The NDCS recommends amendments to several key provisions of current federal day care requirements:

For regulations governing center care for children three, four and five, two principal changes are recommended: (1) amend the group composition requirement by (a) tightening the ceiling on the total number of children permitted in each group (group size), while (b) relaxing the minimum number of caregivers required per group (caregiver/child ratio); and (2) include a separate staff qualifications requirement specifying that staff providing direct care for children must have child-related education/training.

For regulations governing group composition for children under three, the NDCS recommends maintaining the currently required caregiver/child ratio and adding a group size requirement more stringent than that selected for preschool children. While data limitations preclude a specific caregiver qualifications recommendation, it is reasonable to suggest that infant/toddler caregivers should have child-related education/training and such education/training should be available.

In addition, the study shows that regulatory language and rules used to monitor compliance can have as much effect on center practices as the content of the regulations. The study makes a number of recommendations regarding interpretation of regulations and assessment of compliance.

Overview of the National Day Care Study

The Day Care Division of HEW's Administration for Children, Youth and Families commissioned Abt Associates Inc. of Cambridge. Massachusetts to carry out the NDCS. SRI International was selected to gather observation and test data. The major cost/effects study of center-based preschool day care was conducted between 1974 and 1978 at 67 day care centers in Atlanta. Detroit and Seattle. Data from the major study and two supporting studies – a smaller research effort focused on center day care for infants and toddlers, and a national telephone survey of 3100 randomly selected centers – were analyzed to answer three policy questions.

- QUALITY: **Are characteristics of centers which can be regulated (such as caregiver/child ratios, group sizes, and qualifications of caregivers) related to differences in the quality of care received by children under six?**
- COST: **What is the impact of these characteristics on center costs?**
- IMPACT OF REGULATIONS: **What are the potential impacts of alternative federal policies regulating center characteristics on the quality and cost of center day care?**

Findings for Preschool Children

The study's most important findings bear on the composition of the day care class (group size and caregiver/child ratio) and the qualifications of caregivers (education, experience and training).

For children three, four, and five years old,* the NDCS found the following.

Classroom Composition

- GROUP SIZE shows strong and consistent relationships to NDCS measures of quality, and only a slight relationship to center costs.
  - Quality: **Across all study sites, smaller groups are consistently associated with better care, more socially active children and higher gains on two developmental tests.**
  - Cost: **Variations in group size affect cost only slightly.**

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* All discussions of five-year-old children refer to younger five-year-olds enrolled in preschool classrooms. Five-year-olds enrolled in private full-day kindergartens (common in states without kindergarten classes in the public schools) were not studied in the NDCS.

- CAREGIVER/CHILD RATIO shows a slight relationship to NDCS measures of quality, but ratio is strongly related to center costs.

  – Quality: **Caregiver/child ratio, within the policy-relevant range of 1:5 to 1:10, shows some relationships to measures of caregiver and child behavior, although the results are not strong or consistent. Ratio is not related to child test score gains.**

  – Cost: **Caregiver/child ratio is the strongest determinant of differences in center costs. Higher ratios (fewer children per caregiver) cost more. As the number of children decreases, cost per child rises at a progressively faster rate.**

Caregiver Qualifications

- CHILD-RELATED EDUCATION/TRAINING for caregivers shows a moderately strong and consistent relationship to NDCS measures of quality care but little relationship to costs.

  – Quality: **Caregivers with education/training relevant to young children deliver better care with somewhat superior developmental effects for children.**

  – Cost: **Caregivers with child-related education/training do not receive higher wages than other caregivers.**

- EXPERIENCE AND FORMAL EDUCATION show no important relationship to any NDCS measures of quality, and only a slight relationship to center costs.

  – Quality: Neither total years of day care experience, nor total years of formal education, nor degrees or certificates unrelated to child care were systematically associated with caregiver or child behavior or child test score gains.

  – Cost: **Caregivers with several more years of experience or education than average receive only two or three percent higher wages.**

Findings for Infants and Toddlers

For children six weeks to three years of age, the NDCS found the following.

Classroom Composition

Classroom composition is important to quality of care.* Both GROUP SIZE and CAREGIVER/CHILD RATIO are strongly related to NDCS measures of quality for infants and toddlers.

Caregiver Qualifications

Caregiver educational backgrounds are also associated with differences in quality for infants and toddlers. However, data limitations do not permit a determination of the precise education or training factors contributing to this finding.

Regulatory Recommendations

Current federal funding standards – the Federal Interagency Day Care Requirements (FIDCR) – apply only to federally subsidized care for children from low-income families. Originally established in 1968, the FIDCR were designed to promote development of and prevent harm to children in federally supported care. In 1975 the FIDCR were attached (in amended form) to Title XX of the Social Security Act, which provides funds to states for social services. The Title XX FIDCR require caregiver/child ratios of 1:4 for children from 6 weeks to three years, 1:5 for three-year-olds and 1:7 for four- and five-year-olds. Maximum group sizes are 15 for three-year-olds and 20 for four- and five-year-olds. No group size ceiling is set for children under three. There are no specific requirements under the Title XX FIDCR regarding staff qualifications, although the 1968 FIDCR stipulated that caregiving staff should have "training or demonstrated ability in working with children." Revision of these standards could potentially free some funds to serve additional children while maintaining or increasing quality of care.**

Regulations for Preschool Children

For preschool children (three-, four- and five-year-olds), the following regulatory revisions are recommended.

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* The NDCS did not fully separate costs of care for infants and toddlers from costs of care for older children served in the same centers. However, the study did provide several findings that bear on the relative costs of care for children under and over three. The high caregiver/child ratios prevailing in infant and toddler classrooms exert a significant upward pressure on costs, although compensating mechanisms often operate to prevent a large differential between costs for infants and toddlers and costs for older children. Directors' opinions are divided as to the relative costs of care for children under and over three. Many centers charge higher fees for infants and toddlers than for older children.

** Too few caregivers in the NDCS were certified solely on the basis of measured competency to test the adequacy of this important potential alternative to required education/training. Competency-based certification is an important avenue for further exploration since the objective of a qualification requirement is, in fact, to ensure appropriate caregiver behavior.

- **Classroom composition.** Group size and caregiver/child ratio are inextricably related and should be regulated jointly in a single classroom composition provision. Because links between classroom composition and indicators of quality are equally strong for three-, four- and five-year-olds, the same regulations should apply to all three age groups. Three policy options emerge as most consistent with NDCS findings.

	Maximum Group Size		**Maximum Caregiver/Child Ratio**	
	Attendance* Basis	**Enrollment Basis**	**Attendance Basis**	**Enrollment Basis**
Policy A	14	16	1:7	1:8
Policy B	16	18	1:8	1:9
Policy C	18	20	1:9	1:10

An evaluation of the three options indicates the following:

- Policy A would have the most positive impact on the quality of day care provided with public funds.
- Given the importance of group size for quality, all three options would provide higher quality than current FIDCR requirements for four- and five-year-olds. Policy A would provide higher quality than FIDCR requirements for three-year-olds as well.
- All three options would reduce the cost of care relative to current regulations in the range of an estimated minimum of 6 percent for Policy A to a maximum of 16 percent for Policy C. This would allow a potential increase of up to 19 percent in the number of children served at current expenditure levels.
- Between 75 and 90 percent of centers currently providing publicly funded care would be in compliance with all three policy options, without any changes in current operations.
- Depending on the option chosen, between 30 and 60 percent of the centers in the United States not currently serving publicly funded children would immediately be eligible to provide care.

- **Caregiver Qualifications**: Child-related education/training should be required for staff providing direct care to children, and states should make such training available. Requirements should not be framed in terms of either formal education or work experience in day care.

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* Differences between attendance-based and enrollment-based regulatory levels assume the 12 percent child absence rate prevailing nationally, and also assume that absent staff will be replaced by substitutes.

Regulations for Infants and Toddlers

For children six weeks to three years of age, the following regulatory revisions are recommended.*

- **Classroom composition.** The current minimum caregiver/child ratio should be maintained (1:4 observed, 1:5 on an enrollment basis). A group size limit should be established for this age group and should be more stringent than that selected for preschool children.

Recommendations for Monitoring Guidelines

Monitoring guidelines for interpreting regulations and assessing compliance must be tied to the regulations themselves, if the regulations are to be meaningful and enforceable. The study found that the stringency of monitoring guidelines can have as much effect on center practices as the content of the requirements themselves. The following recommendations are consistent with NDCS findings.

Classroom composition regulations should be enforced as absolute minimum standards, not as goals. Group size ceilings should be enforced in every group, except during lunch, nap and outdoor play, and the applicable limit should be determined by the age of the youngest child in each group. Caregiver/child ratio should be calculated on a contact-hour basis, adjusting both for age of children and enrollment of part-time staff and children. Ratio minimums should apply to all times of the day and should apply to the center as a whole, giving directors some flexibility to adjust group-to-group staffing to meet children's needs. Group size and ratio regulations should be based on enrollment rather than on attendance, so that enough staff are present to meet ratio requirements when all children are present. Classroom composition should be monitored by direct observation as well as by auditing schedules, in order to validate schedule data. Volunteers should count as staff only if regularly present for at least ten hours per week. Arrangements should be made for substitutes when staff are absent.

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* Caregiver education/training data could not be analyzed at a level that would allow the development of a specific regulatory recommendation. However, results of the Infant/Toddler Study suggest that age-specific training should be made available to caregivers of children under three.

Suggestions for Fiscal Policy

Reimbursement rates should be directly related to the cost to the provider of meeting purchasing requirements. Subsidized centers must be supported at a level that allows them to comply with regulations. Reimbursement for personnel costs should reflect the different caregiver/child ratios required for children of different ages. Some support for staffing above minimum requirements should be provided. Reimbursement should be based on enrollment rather than on attendance, because centers cannot adjust staff costs when children are absent.

CHAPTER ONE: INTRODUCTION

The National Day Care Study (NDCS) was commissioned in 1974 to assess the impacts of alternative federal purchasing regulations on the quality and costs of federally subsidized **day care.**[*] The study took as its focus the predominant age group receiving federal support – preschool children aged three through five in larger urban day care centers.[**]

The Federal Interagency Day Care Requirements (FIDCR) are the purchasing regulations which since 1968 have governed care directly subsidized by the federal government under some parts of the Social Security Act and other major laws. In 1974, Congress suspended the most controversial provision of the FIDCR, the **day care center** staffing requirements. This action came in the wake of heated debate over both the quality and cost implications of the FIDCR **staff/child ratio** requirements for **preschoolers** – one **staff** person for every five three-year-old children, and one for every seven children four and five years of age. Congress also directed the Department of Health, Education and Welfare (HEW) to report on the appropriateness of the 1968 FIDCR.[†]

Because staff/child ratio was a central **policy variable** in the NDCS, as were other center characteristics currently or potentially subject to regulation, study findings directly address the key issues of interest in the current review and revision of the FIDCR.

This introductory chapter briefly sketches the broader context within which the NDCS has carried out its mandate – the national day care scene in 1978, the history and current scope of federal involvement in subsidizing and regulating day care services, and a brief overview of related research efforts.

DAY CARE 1978: NEEDS AND RESPONSES

Throughout the 1970's, it has become increasingly clear that day care is a vital social and economic resource in support of families.

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[*] Terms which are defined in the Glossary at the front of this volume appear in boldface type when used for the first time.

[**] Because of variations in state kindergarten practices, NDCS research focused on three- and four-year-olds. Younger five-year-olds were, however, part of each year's spring sample. Data available from the NDCS Supply Study[1] show that about 66 percent of day care centers, 69 percent of total enrollment and 71 percent of publicly subsidized enrollment in the United States are found in or near major urban areas. Centers with fifteen or more full-time three- and four-year-old children account for 64 percent of all children in center care, 71 percent of children receiving public subsidies, and 71 percent of all enrolled full-time three- and four-year-old children.

[†] That report, *The Appropriateness of the Federal Interagency Day Care Requirements*, was prepared by HEW's Office of the Assistant Secretary for Planning and Evaluation, and is available through the U.S. Government Printing Office.[2]

In 1978 almost 52 percent of the country's 24.4 million families with children under 13 have a work-related need for some form of day care.[3] *

Increasing demand for day care is clearly reflected in data on the rate of labor force participation by mothers. In 1950, only one-fifth of all mothers with children under 18 were employed; in 1978, this proportion is over one-half. The largest increase in the employment of women over this period has occurred among mothers with children under six; the proportion of these mothers who work nearly tripled (from 14% to 40%) during this period.[4] Department of Labor projections indicate that by 1990 well over half the women aged 20 to 44 – the prime childbearing and childrearing period – will be employed.[5] Labor force participation of mothers is highest among women who head single-parent families. Among two-parent families, the labor force participation of mothers is greater when the father's income is low.[6]

Economic necessity – particularly the need to work away from home – is the principal reason for this extensive use of day care. However, educational, professional, and personal demands are emerging as additional reasons given by parents for needing formal day care arrangements (even for families in need of income).[7]

As a result, large and growing numbers of children are away from both parents for substantial amounts of time each week in a variety of arrangements – in-home and out-of-home, formal and informal, paid and unpaid, cared for by relatives and nonrelatives.

More than 5 million children under 13 are currently cared for by someone other than a parent for 30 hours or more each week **(full-time day care)** – the majority by nonrelatives (56%) and most outside their own homes (69%). In full-time nonrelative care arrangements, preschoolers (ages 3-5) are the largest single age group. Another 6 million children under 13 spend 10 to 30 hours each week in a **part-time day care** arrangement. In the part-time population, school-aged children six and older dominate.

The distribution by type of care of children cared for full-time by nonrelatives is as follows. Approximately 619,000 children are cared for in their own homes for 30 or more hours a week by a nonrelative. More than half are school-aged children; only one-fifth are preschoolers. The remainder are **infants** and **toddlers.**[8] **In-home day care** is not licensed by states, although some states approve in-home **caregivers.**

Approximately 1.2 million children are cared for full-time by a nonrelative in an estimated 670,000 **family day care homes**. Almost two-thirds of these children are under six; about one-third are preschoolers.[9] Most family day care homes are not licensed (either because licensing is not required in some states, or because the providers have not sought licensing). Best estimates, based on state licensing data gathered in late 1976 for the NDCS Supply Study, indicate that there are now slightly more than 100,000 licensed family day care homes serving an estimated 300,000 children, or between two and four children per home (even though most state licensing standards and federal requirements allow up to six children).*

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* Numbers in the text refer to notes appearing at the end of this volume. Notes contain full references for all cited sources and statistics and, where appropriate, additional data or discussion. In every case, best estimates are based on the most current sources available.

There are approximately 18,300 licensed day care centers in the United States serving about 900,000 children, most on a full-time basis.[10] Preschool children (ages 3-5), the largest single age group in full-time day care, constitute 70 percent of the children in day care centers. Roughly equal numbers of older and younger children make up the remaining 30 percent.[11]

Thirty percent of children in day care centers come from poor families, with a yearly income of less than $6,000. The vast majority (74%) of children in centers are from families with a yearly income of less than $15,000, including both incomes of two working parents. Black and other minority children are disproportionately represented in center care, as are children from single-parent families.[12]

All day care is costly for families. In 1975, families spent $6.3 billion on day care services.[13] At its lowest average current price, either family day care or center care for one child would account for 11 percent of the budget of a family of four with an income of $10,000, and would be the fourth largest family budget item, after food (28%), housing (19%) and all taxes (12%).[14] The cost of day care for many children of lower-income families is partially or fully paid by some source other than their parents.

CURRENT FEDERAL INVOLVEMENT IN DAY CARE

Against this backdrop of rising demand for day care services, the impoverished state of many families in the United States has increasingly drawn the federal government into day care and early childhood initiatives. In recent years, the federal government has become a major **funding source** for the purchase of day care services for children from six months to 13 years of age, spending about $2.3 billion in 1977, or 25 percent of the estimated $9 billion expended nationally that year for day care services.

During fiscal year 1977, HEW reported spending more than $950 million under Title IV-A (Aid to Families of Dependent Children), Title IV-A/IV-C (Work Incentive Program), Title IV-B (Child Welfare Services) and Title XX (Grants to States for Services) of the Social Security Act to purchase care for more than 1 million children. According to HEW estimates, some 900,000 children received day care in settings where providers were directly reimbursed with public funds. Care for an additional 145,000 children was supported indirectly through parents' deduction of day care-related expenses under the AFDC income disregard provision of Title IV-A. Additional HEW funds were spent on child care in Head Start and various programs funded under the Elementary and Secondary Education Act (ESEA).[15]

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* **Group day care homes** have been traditionally defined as homes having from 7 to 13 children and one or two adults. The National Day Care Supply Study found so few such facilities that they are not considered further.

Several additional federal programs – administered by the Departments of Interior, Labor, Housing and Urban Development, and the Community Services Administration – also support day care services. Other federal sources support day care less directly. The Department of Agriculture provides funds for meals and snacks to eligible children in nonprofit centers and family day care homes. The Internal Revenue Service sets guidelines for income tax credits for child care expenses.

Estimated federal and state expenditures for all day care and early childhood programs in fiscal year 1977 total more than $2.75 billion,* and are divided as follows:[16]

	(in millions)
Title XX Grants to States (HEW)	$ 809
AFDC Income Disregard (HEW)	84
Work Incentive Program (HEW)	57
Child Care Food Program (DOA)	120
Child Care Tax Credit (IRS)	500
Head Start (HEW)	448
ESEA Title I Preschool/Kindergarten	136
Other Direct Programs (minimum estimate)	99
Federal Subtotal	2,253
Estimated State/Local Match	500
Total	$ 2,753

Federal funds pay for care in a child's own home, in the home of a relative, in family day care homes and group day care homes, and in day care centers. However, the bulk of direct federal support subsidizes center day care. The latest available figures (fiscal year 1976) show that about 70 percent of Title XX day care expenditures purchased this form of day care; family day care and in-home care accounted for 17 and 14 percent, respectively.[18] Of the 18,300 centers in the United States, approximately 8,000 enroll some federally funded children. Care for more than half of the 400,000 children in these centers is paid for, at least in part, by direct government reimbursement.

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* Seen in perspective, this amount is less than 1 percent (0.67%) of all federal expenditures ($412 billion) and less than two-tenths of 1 percent (0.15%) of the Gross National Product ($1,838 billion) for the same year.[17]

HISTORY OF FEDERAL INVOLVEMENT IN DAY CARE

The federal government's first significant involvement in day care began during the Depression. In 1933, Works Project Administration (WPA) funds were used for the first time to hire unemployed women (and some men) to serve in WPA-sponsored day nurseries. By 1937, there were 1,900 such programs serving some 40,000 children. The federal initiative at this time was directed primarily to providing jobs for the unemployed.[19]

During World War II, the level of federal support increased. In 1942, funds from the Community Facilities Act (better known as the Lanham Act) and other federal and state sources were used to provide day care facilities and services in order to free women to join the war's industrial effort. By 1945, over $75 million in federal and state funds had been channeled into day care, primarily through school systems.[20] Funding of day care under the Lanham Act was a short-term response to a national emergency. With the end of the war, federal funds for day care were withdrawn, and federal involvement in day care waned, not to be resumed for more than 15 years.

Beginning in the 1960's and continuing to the present, three sometimes divergent views of day care have shaped federal involvement. In the first view, day care is seen as a service to parents, designed to free welfare recipients for training and/or employment and thereby reducing welfare support. In the second, it is seen as providing as a child welfare service under at least two major federal programs. Finally, federally funded day care is viewed as an opportunity to assist children in overcoming the developmental disadvantages that poverty is presumed to foster. The passage in 1964 of the Economic Opportunity Act, which established the Head Start program, set the stage for federal support of comprehensive services to children.

Legislative events in the late 1960's radically increased federal involvement in serving both welfare parents and children. An amendment to Title IV-A of the Social Security Act permitted child care to be treated as a work-related expense, the cost of which could be deducted from a parent's income (income disregard), before determining the size of the grant given under the program of Aid to Families of Dependent Children (AFDC).[21]

Substantial direct funding of day care under Title IV-A was also authorized, to encourage welfare recipients to work or to take part in work-related training. Underlying this legislation was an assumption that federal support of day care would in the long run reduce the net cost of welfare by allowing welfare parents to enter the labor force. Title IV-A also permitted states to provide day care for "former or potential" AFDC recipients. This provision was seen as an opportunity to provide day care support as an alternative to welfare for families not receiving AFDC benefits. As a result, widespread expansion of day care occurred in the late 1960's and early 1970's.[22]

FEDERAL REGULATION OF DAY CARE

Increased federal involvement in the purchase of day care called for standards governing the type and quality of care to be bought with federal dollars. A 1967 amendment to the Economic Opportunity Act led to the development of the 1968 Federal Interagency Day Care Requirements (FIDCR).[23] The FIDCR were the product of a task force consisting of representatives from the Department of Health, Education and Welfare, the Department of Labor, the Office of Economic Opportunity and other agencies responsible for one or more programs that funded day care services. The task force was charged with developing a set of standards which would apply uniformly to all day care facilities serving federally subsidized children. The 1968 FIDCR established requirements governing **staff/child ratios** and maximum **group sizes** for children between the ages of three and 14, laid down specifications for **caregiver qualifications**, required the provision of social and health services, mandated parental participation in policymaking for centers serving 40 or more children, and called for an educational component in the day care program. The FIDCR were made part of the Code of Federal Regulations early in 1969.

Although the framers of the FIDCR did not provide explicit justifications for the various requirements, it is apparent that two broad interrelated goals were paramount:

- to protect children in publicly funded day care from exposure to potential harm; and
- to ensure that children in publicly funded day care would experience conditions believed to promote their development.

A third objective of the FIDCR was to promote the employment of low-income persons as staff in day care centers.

There was some confusion in the day care community about whether the FIDCR were intended to be program goal standards purchasing regulations, or federal licensing standards. Further, the language of individual requirements was sufficiently ambiguous that interpretation, and therefore compliance, varied widely among the states.[24]

Late in 1974, Congress enacted an amendment to the Social Security Act (Title XX, Grants to States for Services), which became effective on October 1, 1975.[25] Title XX incorporated in law the 1968 FIDCR as requirements for out-of-home care, with certain modifications. The Title XX law authorized HEW to establish staff/child ratio requirements for children under three and to modify center staffing ratios for children six through ten, made the educational services requirement optional and lowered the staff/child ratios for children over ten. Moreover, states were permitted to spend Title XX day care funds *only* in facilities that met the revised FIDCR. Severe financial penalties were to be levied for noncompliance.

Although in theory the FIDCR had always had the force of law, their incorporation into the Title XX statute as funding requirements made the FIDCR the focus of major controversy. There was widespread concern that FIDCR provisions (e.g., regarding caregiver qualifications and staff/child ratio) were too imprecise to permit uniform interpretation, monitoring or enforcement. Some critics also argued that a distinction should be made in enforcing the FIDCR between requirements essential for protecting children from harm and those which they felt went beyond meeting basic physical and emotional needs of children.

The most strenuous controversy, however, arose over FIDCR staff/child ratio requirements. In particular, one group of concerned citizens feared that without strict ratio requirements, the government would "warehouse" children in harmful surroundings while forcing their parents to work. Other groups feared that the implementation of the FIDCR staff/child ratio requirements – which were much more stringent than those in most state licensing standards – would have severe cost consequences for parents, providers, states, and/or the federal government. Furthermore, many felt that enforcement could lead to economic segregation, with some centers serving only federally funded children and other centers refusing to serve these children.

In view of this heated controversy, before the requirements became effective, Congress suspended enforcement of the Title XX staff/child ratio requirements for children six weeks to six years in centers and group day care homes. However, it required these facilities to maintain their actual 1975 staff/child ratios, or to meet those required by states in 1975, whichever were higher.[26]

The Title XX legislation directed the Secretary of Health, Education and Welfare to prepare a report on the appropriateness of the FIDCR. This report was submitted to Congress in July 1978.

Its conclusion was that federal regulation of day care was indeed appropriate but that the FIDCR were in need of revision. The FIDCR Appropriateness Report has served to stimulate renewed public debate over the nature of federal involvement in day care.

The National Day Care Study was funded prior to enactment of Title XX – before the controversy over the FIDCR led Congress to mandate the study of their appropriateness. In contrast to the Appropriateness Report, the NDCS was not conceived as a study of the FIDCR. Rather, it was intended to fill a large gap in the existing policy research literature concerning the impact of regulatable center characteristics on day care **classroom processes**, children's **developmental outcomes** and **costs**, thus providing an empirical basis for federal policy decisions regarding purchasing standards for day care. Although NDCS results can inform the current FIDCR debate, the study did not address the appropriateness of the FIDCR directly. (A fuller explanation of the objectives of the NDCS will be found in Chapter Two.)

PRIOR AND CONCURRENT DAY CARE RESEARCH

Both the 1968 FIDCR and Title XX modifications to the FIDCR relied heavily on opinions of child care and child development specialists – opinions based on experience and the best research data available. Available data, however, did not fully meet the needs of policymakers in 1968 or in 1974. Several national studies published in the late 1960's and early 1970's provided useful information on supply and demand for day care and on center operations and costs. Many additional investigations, generally of smaller scale, performed both before and after the FIDCR controversy arose, shed light on the developmental impacts of various kinds of child care. However, no single study or set of studies attempted to link quality, costs and market data in a way that would help policymakers assess the benefits, costs and market impact of alternative regulations.[27]

Major supply/demand research was conducted by Low and Spindler, Westinghouse Learning Corporation and Westat Research, Inc., and Unco. These studies provided important information on national availability and use of the different types of day care. The Westat and Unco studies also reported data on the cost of day care. The Unco study contained information on parent satisfaction and preferences in day care arrangements. None of these studies attempted to assess the quality of available day care or to link quality factors to costs.* Other studies of day care costs were limited in scope and lacked systematic data collection techniques.

Many smaller-scale studies have examined the impact of group care arrangements on children's development – a fundamental aspect of day care quality. However, much of this research focused on children younger than preschoolers, on group environments other than day care, and on questions other than those of central concern to policymakers. For example, many studies compared group care with home rearing, whereas few examined the effects of regulatable characteristics of the group care environment. Of those studies that did examine policy-relevant center characteristics, none was able to isolate the effects of a broad set of these characteristics across a range of levels relevant for regulation. Moreover, most existing studies had been done on a small scale, with relatively homogeneous child populations unlike the population in federally funded care.

In 1974, the need was clear for a study using a comprehensive set of center characteristics, a sample of centers and children likely to be affected by federal policy, and a design adequate to separate the effects, on quality of care, of ratio, group size and other characteristics, to relate them to costs, and to assess their impact on center day care nationally. It was in response to this need that the Administration for Children, Youth and Families (then the Office of Child Development) initiated the National Day Care Study.

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* There has been considerable misunderstanding on this point with regard to the Westat study. Westat categorized centers used in the study as "custodial," "educational," or "developmental or comprehensive." This typology was not meant to distinguish the quality of centers, but to focus solely " . . . on aims of the program and descriptive elements, without regard to whether these aims are being met, how well the elements are functioning, or what effects they have on the children and families being served . . . [and] should not be confused with levels of quality."[28] The words custodial, educational, and comprehensive, however, already carried the weight of value judgments about quality. In addition, since costs of programs classed as custodial were less than those of the other two program types, quality and cost issues became entangled. This misreading has led to considerable confusion and controversy.

CHAPTER TWO: OBJECTIVES AND DESIGN OF THE NATIONAL DAY CARE STUDY

The overall objective of the National Day Care Study (NDCS) was to provide empirical information in three areas of major policy concern: (1) the quality of day care provided in federally subsidized programs; (2) the per-child cost of the day care provided; and (3) the potential quality/cost trade-offs that may be associated with alternative formulations of federal day care regulations. Today, government policymakers continue to face the central question of how to provide the greatest number of children with day care programs that facilitate normal rates of growth in critical areas of development.

The Administration for Children, Youth and Families (ACYF) funded two research organizations to conduct the NDCS: Abt Associates Inc. of Cambridge, Massachusetts, and SRI International of Menlo Park, California. Abt Associates had overall administrative and technical responsibility for the study; SRI, as testing contractor, was responsible for selecting, field testing and administering measures of both day care classroom processes and children's development.

This chapter describes the major policy questions addressed in the NDCS and the policy variables chosen for study to meet research objectives. The NDCS conceptual framework, major design decisions, study implementation and provisions for peer review are also discussed.

POLICY FOCUS OF THE NDCS

Policymakers concerned with issues of quality and cost in 1974 needed very basic information about federally subsidized day care. They needed to know:

- which characteristics of the day care environment have important impacts on children's development; and
- the costs associated with these characteristics.

It was clear in the design stage that this examination should be focused on the largest group of children receiving federally subsidized care and on the day care settings where they were to be found. Then as now, preschool children three, four and five years of age constitute the largest federally subsidized day care population; most of these children are in urban day care centers serving low-income families. It was also clear that the primary research emphasis should be focused on those program characteristics which have long been considered key determinants of quality and cost in center care – staff/child ratio, group size and caregiver qualifications. *Thus, the mandate of the NDCS was to examine the impact of variations in the major regulatable characteristics of federally subsidized center-based day care on the quality and cost of care received by preschool children.*

Before turning to the major policy questions and variables addressed by the NDCS, it is important to make clear which central issues were beyond the NDCS research mandate.

- The NDCS was not a study of the effects of day care per se, nor of day care versus home rearing. Rather, the NDCS focused on the effects of federal policy upon the large and growing number of children already in day care.
- The NDCS did not address the question of how much federal funding *should* be committed to day care support. The study's effects, cost and cost/effects research has been devoted solely to defining which mix and levels of program characteristics provide good day care for the most children.
- The NDCS did not compare different types of day care – center-based day care versus family day care or in-home day care. Early evidence from a current study of family day care suggests that, due to differences in the populations served, family day care should be considered complementary to center day care rather than competitive with it. So little is known about in-home care of children by nonrelatives that comparative questions cannot even be addressed.
- Because programs serving school-age children are so different from settings for younger children, an examination of the effects and costs to this form of care was not included.
- Because of major measurement problems the special needs of bilingual and handicapped children in day care were not addressed.
- The NDCS did not evaluate day care center program content per se. It measured effects and costs associated with center characteristics.
- The focus of the study was not *whether* to regulate, but rather *what* to regulate. Questions of the appropriateness of federal involvement in and regulation of day care are political and philosophical issues that were beyond the study's charter.
- Although NDCS findings on the effects and costs of center characteristics provide useful information for state licensing and day care management, the study did not examine the issue of the proper roles of different levels of government in day care regulation.

Major Policy Questions

To fulfill its mandate, the NDCS addressed the following major policy questions.

- How is the development of preschool children in federally subsidized day care centers affected by variations in staff/child ratio, caregiver qualifications, group size and other regulatable center characteristics?
- How is the per-child cost of federally subsidized, center-based day care affected by variations in staff/child ratio, caregiver qualifications, group size and other regulatable center characteristics?
- How does the cost-effectiveness of federally subsidized, center-based day care change when adjustments are made in staff/child ratio, caregiver qualifications, group size and other regulatable center characteristics?

The answers to these questions are intended to play a major role in both the review of and decisions about current regulation and funding practices that affect those day care centers serving federally subsidized preschool children.

Study Focus: Policy Variables

Because the NDCS was designed to address issues of policy relevance, only those characteristics of day care centers which were currently or potentially subject to government regulation and which were believed to affect the quality of a child's day care experience were selected for study as **independent variables**; that is, as variables whose costs and effects were to be measured. Regulated characteristics included staff/child ratio, size of child groupings, caregiver qualifications, in-service training, nutritional program, health care services, parent participation and provision of **supplemental services** to children and families. Many other characteristics, if regulated, could potentially promote children's development: director qualifications, continuity of care (the stability of relationships between particular caregivers and children), center philosophy, educational programs, equipment and educational materials, and the amount and type of space available.

Although these center characteristics were examined in the NDCS, three were selected by ACYF for primary study: staff/child ratio, group size and caregiver qualifications. These particular characteristics have been widely *assumed* to influence the nature and number of daily contacts between caregivers and children and among children within day care centers in the following ways.

- Higher staff/child ratios (more stringent ratios) reduce the risk of damage and increase the opportunity for successful stimulation of children's cognitive and social development.
- An upper limit on group size is necessary both for children's safety and for the creation of a properly supportive environment for growth.
- Education, training and experience foster caregivers' sensitivity to children's needs and their ability to meet these needs.

Because such assumptions have been broadly held, staff/child ratio and staff qualifications have been central in many state licensing standards and in federal purchasing regulations, and became the policy variables of prime interest in the NDCS. Group size, specified in the FIDCR, is not regulated in most states, probably on the assumption that regulation of staff/child ratio accomplishes the same purpose.

Another major reason for selecting these characteristics for investigation was that two of them – staff/child ratio and caregiver qualifications – were known to have a significant impact on the per-child cost of day care. The controversy over cost issues associated with the FIDCR staff/child ratios, in particular, confirmed the need for an in-depth study of their costs. The major policy variables were selected only after an extensive review of available research findings to determine which center variables were most likely to have an important impact on children and on center costs, and which variables were measurable and regulatable.

Other regulatable center characteristics, listed above, were also investigated. It was clear from the outset, however, that it would not be possible to assess fully the costs and effects of the full range of center characteristics without significantly diminishing the quality of investigation for the primary policy variables. Therefore, exploratory investigations were first performed to determine which of these other center characteristics could be measured and analyzed adequately within the constraints of the study design and sample, which had been built around the primary policy variables. Those characteristics whose costs or effects proved amenable to assessment within the study framework were appropriately analyzed; remaining characteristics were treated in a purely descriptive fashion.

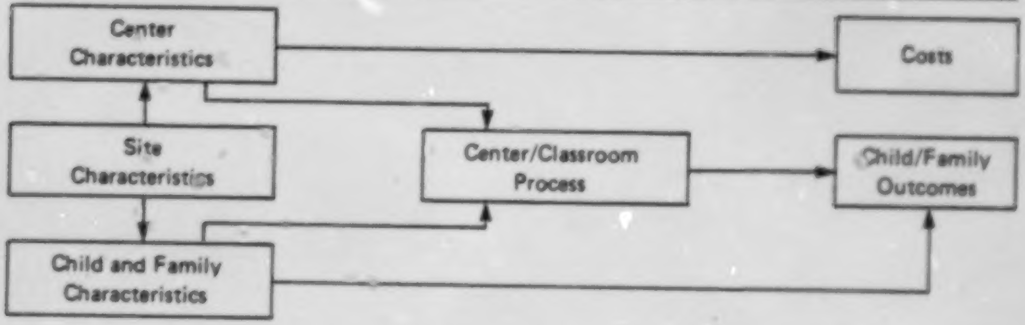
STUDY DESIGN: CONCEPTUAL FRAMEWORK

The conceptual framework of the NDCS is a set of general assumptions about causal relationships in center day care, illustrated in simplified form in Figure 2.1. Assumptions reflected in the figure include the following.

- Characteristics of centers, children and families vary across sites (i.e., cities or geographic locations).
- Background characteristics of children and families (e.g., ethnicity, socioeconomic status) and center characteristics (e.g., auspices, enrollment, curriculum, child groupings and staffing patterns) influence center and classroom process, particularly interactions between caregivers and children.
- Center and classroom process affect the outcomes of day care, such as children's social, emotional and cognitive development, and parents' satisfaction with their day care arrangements.
- Child and family characteristics also affect outcomes directly, without mediation by classroom process (family background, for example, has an effect on a child's social development that is independent of any day care influence).
- Center characteristics, including but not limited to enrollment, staff/child ratio and caregiver qualifications, determine the per-child cost of care.

As explained above, the objective of the NDCS was to estimate statistically the magnitude of the assumed causal relationships and to use the results to evaluate costs and effects of alternative configurations of day care center characteristics.

Figure 2.1: Conceptual Model of Center Day Care



The NDCS consists of a major *Cost/Effects Study* of center-based day care for preschoolers, and two substudies: a *Supply Study* and an *Infant/Toddler Day Care Study*. Figure 2.2 summarizes the major components of the NDCS and the study's timetable. The major cost/effects component focused on the center environment of the preschool child, the quality of the child's experience and some of the consequences of that experience both for the child's development and for costs. *Children at the Center* focuses on the findings and implications of the Cost/Effects Study.

The Supply Study was a national telephone survey designed to collect information about enrollment, staffing, costs and other characteristics of centers. Unlike the Cost/Effects Study, the Supply Study was not limited to those centers primarily serving preschool children. Results are based on a national probability sample of over 3100 centers, stratified by state. The data provide a profile of center-based care available nationally and by state, as well as an estimate of compliance with state and federal regulations. Supply Study data also play an important role in estimating the national implications of the results of the cost/effects component of the NDCS and in assessing the impact of alternative regulations, funding policies and monitoring practices on key center characteristics.*

The second supporting study of the NDCS focused on center care arrangements for children under three. The Infant/Toddler Day Care Study was initated after staff/child ratios for infants and toddlers were authorized by Title XX in 1975. This research effort was designed to provide policymakers with three kinds of data not previously available. First, centers caring for infants and toddlers were surveyed nationally to provide data about their distribution and characteristics (e.g., equipment, staff/child ratios, group sizes, program schedules and activities). Second, on-site interviews were conducted with center directors, caregivers and parents to gather more detailed data on these center characteristics, as well as opinions about infant and toddler care. Third, staff were observed as they cared for infants and toddlers. These observation data were used to develop a profile of caregiver behavior. Staff/child ratio and caregiver qualifications were of central concern in the Infant/Toddler Day Care Study; center characteristics and caregiver behavior were examined in relation to these variables.**

STUDY IMPLEMENTATION

The NDCS Cost/Effects Study was conducted in three phases. Phase I (July 1974 to September 1975) was devoted to refinement of the study design, to selection of sites and centers and to initial selection and field testing of study instruments. Phase II (September 1975 to September 1976) was a year-long study of regulatable center characteristics and associated **child outcomes** as they existed

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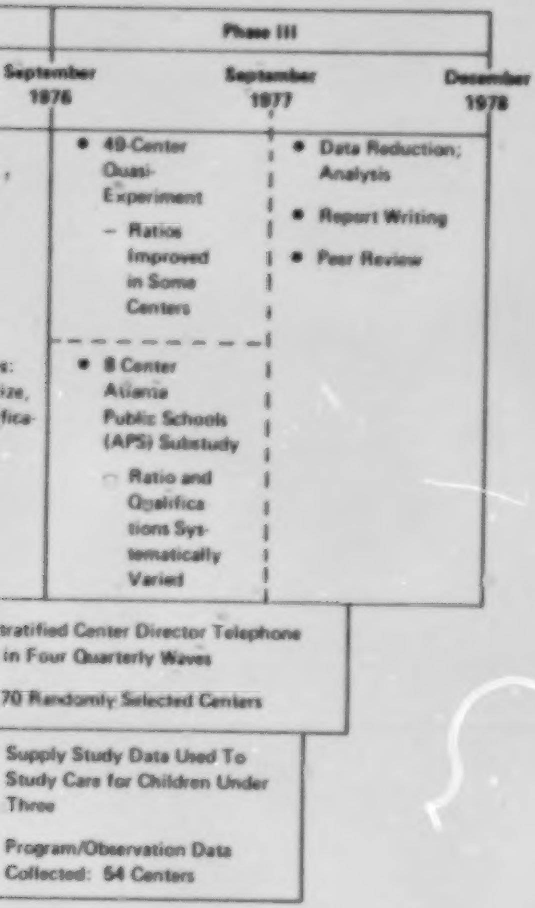
* Results of the Supply Study appear in Volume III of the NDCS Final Report.[1] A summary of findings from the Supply Study is presented in Appendix A of the present volume.

** Results of the Infant/Toddler Study appear in Volume IV-D of the NDCS Final Report.[2] A summary of findings from the Infant/Toddler Study is presented in Appendix B of the present volume.

Figure 2.2: National Day Care Study Design and Implementation

	Phase I	Phase II	
	July 1974 – September 1975	September 1975 – September 1976	
MAIN COST/ EFFECTS STUDY	• Design • Instrumentation • Selection of 3 Sites and 64 Centers	• Natural Study – Atlanta 32 Centers – Detroit 16 Centers – Seattle 16 Centers • Policy Variables: Ratio, Group Size, Caregiver Qualifications	• 49-Center Quasi- Experime – Ratios Improv in Som Centers • 8 Center Atlanta Public Sch (APS) Sub – Ratio a Qualific tions S tematic Varied
SUPPORTING SUPPLY STUDY	• 3100 Random State-Stratified Center Direct Interviews Conducted in Four Quarterly Wa • On-Site Verification: 70 Randomly Selecte		
SUPPORTING INFANT/TODDLER STUDY		• Supply Study Data U Study Care for Childr Three • Program/Observation Collected: 64 Center	



Phase III

September 1976

September 1977

December 1978

- 49-Center Quasi-Experiment
  - – Ratios Improved in Some Centers
- 8 Center Atlanta Public Schools (APS) Substudy
  - – Ratio and Qualifications Systematically Varied

- Data Reduction; Analysis
- Report Writing
- Peer Review

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tratified Center Director Telephone in Four Quarterly Waves

70 Randomly Selected Centers

Supply Study Data Used To Study Care for Children Under Three

Program/Observation Data Collected: 54 Centers naturally in the day care centers chosen for the NDCS. Further field testing and assessment of instruments were also conducted. Phase III (October 1976 to September 1977) was designed as a more rigorous test of the effects of variables most important for policymaking.*

Phase I

One major task of Phase I was selection of study sites and centers.** Practical considerations made it impossible to conduct the study at a large number of sites. The aim of NDCS staff in selecting study sites was therefore to select a small number of cities in different geographic areas, having different demographic make-ups, reflecting regulatory diversity and offering sufficient numbers of centers at each site to implement the Phase II study design (to be discussed below). This selection process maximized the generalizability of the study's results by wide variation among centers along crucial dimensions. Telephone interviews with licensed centers in 17 major cities led to the selection of Atlanta, Detroit and Seattle as the study sites. A total of 64 centers at the three sites were subsequently selected for participation in Phase II.

In addition to site and center selection activities, Abt Associates staff also developed and tested a system for collecting program and financial information and for assessing parent attitudes. At the same time, SRI staff formulated a set of **process** and **outcome** variables to be studied in Phase II and selected and field tested instruments for collection of data on children and caregivers including both observation systems and standardized tests.

Phase II

In the absence of prior large-scale research on effects of variations in day care arrangements, it was not feasible at the outset of the NDCS to design an experiment that took full account of the complexities of the day care world. Therefore, instead of proceeding directly from design and instrument development (Phase I) to the experimental study (Phase III), an intervening descriptive phase was mandated by ACYF in which center characteristics would not be altered but rather would be studied as they occurred naturally. At the same time, instruments and analytic techniques were to be further developed and refined. In this way, Phase II results would provide a substantive and methodological base for conducting Phase III.

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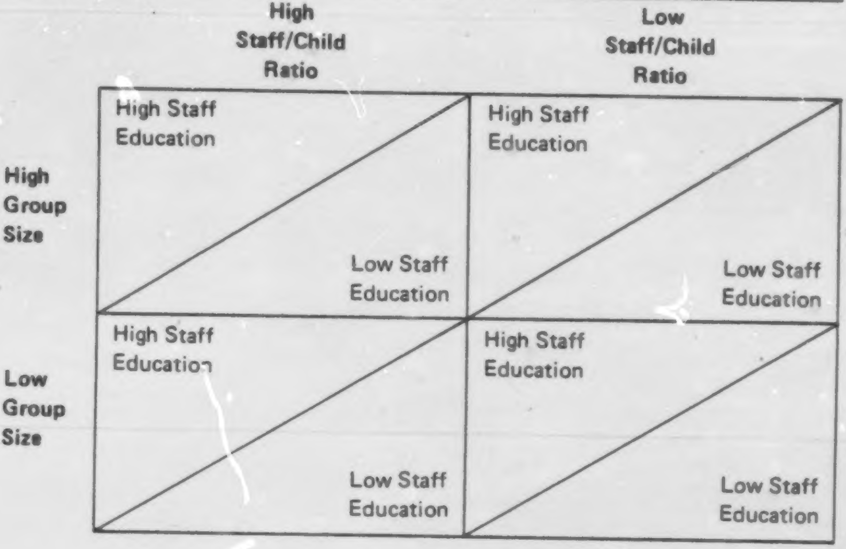
* Major analysis of study data began in September 1977 and continued through December 1978.

** Site and center selection are described in detail in Chapter Three.

54

In the Phase II design illustrated in Figure 2.3, centers were to be classified as having high or low values for each of the three major policy variables – staff/child ratio, group size and staff education – yielding eight center types. This design maximized variation across centers on each of the policy variables and insured the independence of the policy variables by including centers which differed by only one variable at a time. Thus the design had considerable statistical power to disentangle effects of these three policy variables.

Figure 2.3 Design of the Phase II Natural Study



During Phase II, this design was implemented in 64 day care centers in Atlanta, Detroit and Seattle. Measures of classroom process, based on observations of caregivers and children, and measures of developmental change, based on standardized tests and rating scales, were administered in all 64 centers. In addition, a survey of parent attitudes was administered to parents of most of the children in the study sample. Data were analyzed with the aims of (1) formulating initial hypotheses about relationships among regulatable center characteristics, classroom process and developmental outcomes; and (2) refining the measures of regulatable characteristics, classroom process and developmental outcomes to be used in Phase III. Phase II analyses in fact led to a better understanding of the policy variables, as discussed in Chapter Four, and to revision of the instrument battery and reconceptualization of process and outcome variables, discussed in Chapter Five.[3]

Phase III

Phase III was designed to answer definitively the study's three major policy questions. The Phase III investigation had two components: a 49-center quasi-experiment conducted across all three study sites, and an experiment conducted in eight centers in the Atlanta Public Schools (APS). The eight APS centers were not included in the 49-center sample. In both studies, selected center characteristics were altered systematically, permitting measurement of costs and effects associated with such changes.[4]

The quasi-experiment was a comparison of three groups of centers (Figure 2.4). Group I (the "treatment" group) consisted of 14 centers which had low observed staff/child ratios in Phase II (1:9.1), and whose ratios were increased to 1:5.9 in Phase III.* Effects of this treatment on caregivers and children were compared with results from a matched group of 14 untreated low-ratio (1:9.1) centers (Group II) and with those from a group of 21 untreated high-ratio (1:5.9) centers (Group III). Group size and caregiver experience and years of education were equally distributed to the extent possible across the three experimental groups, so that the effects of ratio could be clearly separated out. Ratio was chosen for manipulation because of its critical policy relevance; manipulation would reduce any confounding between ratio and other center characteristics, permitting clearcut assessment of its effects.

Figure 2.4: Design of the 49-Center Quasi-Experiment

Group I	–	Treated centers
	–	(Observed mean ratio for 14 centers = 1:9.1 in Phase II; ratio raised to 1:5.9 in Phase III)
Group II	–	Untreated low-ratio centers
	–	(Observed mean ratio for 14 centers = 1:9.1)
Group III	–	Untreated high-ratio centers
	–	(Observed mean ratio for 21 centers = 1:5.9)

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* Note that, in conformance with HEW directives, manipulation consisted only of making low ratios higher. The Group I treatment simulates one potential effect of full enforcement of the FIDCR under Title XX – namely an increase in ratios in centers serving publicly funded children but currently operating below FIDCR ratios.

The APS Study was an eight-center, 29-classroom experiment in which children were randomly assigned, within centers, to classrooms which differed systematically in level of staff education and staff/child ratio (Figure 2.5). Group size and caregiver experience were equally distributed across the three experimental groups. This design made possible a relatively clearcut assessment of the effects and interactions of staff education and staff/child ratio for children of different ages (three- and four-year-olds).

Figure 2.5: Design of the Atlanta Public Schools (APS) Eight-Center Experiment

	High Ratio (Observed Mean Ratio = 1:5.4)	Low Ratio (Observed Mean Ratio = 1:7.4)
High Staff Education	4 Classrooms	4 Classrooms
Medium Staff Education	7 Classrooms	4 Classrooms
Low Staff Education	6 Classrooms	4 Classrooms

High staff education:	lead teacher was a center director, usually with a master's degree
Medium staff education:	lead teacher was a graduate of Atlanta Area Technical School's two-year day care program
Low staff education:	lead teacher had not completed the Atlanta Area Technical School's two-year day care program

Staff in the APS centers fell into three distinct categories of educational background. All center directors (who were required to work in classrooms as well as to function as directors) had bachelor's degrees; most also had master's degrees. **Lead teachers** were graduates of the Atlanta Area Technical School's (AAT) two-year post-secondary training program in day care or had completed at least two years of college. **Aides** generally had high school diplomas (or an equivalent such as the G.E.D.); the majority of aides had also completed the 60-hour state-required training courses in day care offered through AAT.* As shown in Figure 2.5, persons at these three levels of education were assigned to be lead teachers in the experimental APS classrooms – some in classes with relatively high staff/child ratios, others in classes with lower ratios. Children were then randomly assigned within centers to these experimentally organized classes. Random assignment, together with the fact that the children served by APS centers were unusually homogeneous in ethnic and socioeconomic background, minimized any confounding of center characteristics and children's background characteristics. Because the two Phase III components addressed the same policy questions but had designs with different experimental strengths, consistent results from the two study components constitute a far sounder basis for policy conclusions than would findings from either component alone.

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* See Chapter Six note 9 for a description of the AAT programs.

STUDY REVIEW: CONSULTANT PANEL

It was recognized early in the NDCS that intensive review of the study's design, analyses and findings by technical and policy experts was essential to maintain the quality and integrity of the study. Both Abt Associates and SRI organized panels of experts to review the study. The SRI panel contributed to selection of the Phase II dependent variables and instruments. The Abt Associates consultant panel met periodically throughout the study. This nationally selected group of experts reviewed all major reports, advised NDCS staff and made important suggestions that improved the design and implementation of the study. In addition, ACYF had three consultants who reviewed reports and participated in all major design and analysis discussions.*

The Black Task Force, a subgroup of the consultants, was organized during Phase II of the study. Its members, some of whom were members of the original consultant panel and some of whom were added in Phase II, identified important technical and policy issues of particular concern to minority groups, such as the appropriateness and significance of NDCS outcome measures for black children. In addition, the Task Force fostered the increased involvement of black scholars and day care specialists in the NDCS research. The special concerns of the Task Force are discussed throughout this report and are summarized in the *Commentary* that follows Chapter Eight.**

An independent review of the NDCS Final Report was conducted by six additional specialists in the fields of child development, methodology and economics.

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* The names of all consultants involved in peer review are listed in Appendix C.

** The *Commentary* is a summary of a detailed report which appears in Volume IV-A of the NDCS Final Report.[5]

CHAPTER THREE: THE NATIONAL DAY CARE STUDY SAMPLE

Formulation of the National Day Care Study's (NDCS) policy questions and identification of the major policy variables established a framework for selecting centers, sites and children to be observed and tested. The sample was selected to:

- assure adequate representation of centers most relevant for policy; that is, those serving or eligible to serve low-income children through public subsidy;
- assure that the policy variables were distributed across the full range of levels relevant for current policy choices and were sufficiently independent of one another to allow separation of their effects;* and
- maximize the power of the study to draw logical inferences about effects of the policy variables in widely varying day care environments.

In this chapter, the criteria used to define the study sample and the process by which sites and centers were selected are outlined. The chapter also presents a description of children and families in the study population, a profile of Phase III centers and an evaluation of the sample.

SELECTION OF THE UNIVERSE OF CENTERS

Criteria for selection of the universe of centers to be studied in the NDCS were designed largely to maximize representation of policy-relevant centers – those serving or eligible to serve low-income children receiving subsidized care. Additional criteria were dictated by research considerations, such as cost of data collection, adequacy and stability of the sample, and feasibility of measurement. Selection criteria required that centers in the sample:

- *be licensed day care centers, located in urban area, and serving or eligible to serve federally subsidized children.* Licensing is a precondition for purchase of subsidized center care. Centers were chosen over family day care homes because they supply 80 percent of licensed day care slots and receive a large portion of federal day care subsidies. Urban centers were chosen both for logistic reasons and because licensed center care is predominantly urban. Both centers funded primarily by the federal government and centers funded primarily by parent fees were included.

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* Definition and measurement of the NDCS policy variables are discussed in Chapter Four.

- *provide year-round full-day care.* Only full-time year-round centers offer day care arrangements which satisfy a major intent of federal day care appropriations under Title XX – promoting parents' economic self-sufficiency by freeing them for training and work. Thus, to be eligible for participation in the study, a center had to be open at least seven hours per day, five days per week and ten months per year.
- *have been in operation at least one year.* To increase the probability that centers would continue in operation throughout Phases II and III, and to avoid studying non-recurring start-up behavior, centers were required to have been in operation for at least one year at the time they were selected.
- *serve English-speaking preschool children.* Because preschool children aged three through five constitute the majority of the center day care population, they were a high priority study group. Children from non-English-speaking families were not included in the research sample for two reasons. First, adequate test batteries for non-English-speaking children did not exist. Second, non-English-speaking children constitute a small percentage of the day care center population.
- *have an adequate sample of full-time three- and four-year-old children.* To insure that start-of-year and end-of-year test data would be available for an adequate number of children, centers were included in the sample only if they had 15 or more three- and four-year-old children enrolled on a full-time basis.

SELECTION AND DESCRIPTION OF SITES

Selection of NDCS sites proceeded in light of the above criteria for eligible centers. The following sections describe this selection process and the three study sites which were chosen.

Selection of Sites

The study's three sites – Atlanta, Detroit and Seattle – were chosen to be as diverse as possible, in order to determine whether regulatable center characteristics have different costs or effects in different geographic, demographic and regulatory environments.[1]

Four general criteria were used for site selection. It was necessary that sites:

- have enough eligible centers, each with adequate distributions of the policy variables, to allow full implementation of the study;
- represent different geographic regions of the country, to test for potential differences in effects due to geographic factors;
- show different demographic and socioeconomic characteristics, to test for potential differences in effects associated with differences in children's backgrounds; and
- exhibit regulatory diversity, to test for differences in findings attributable to state and local regulatory policies.

During Phase I, socioeconomic information on 50 urban areas, obtained from census data, licensing authorities and other governmental sources, was used to identify 17 potential study sites meeting the above criteria. Most of the original 50 cities were disqualified because they did not have enough eligible centers for full implementation of the study. Seven of the 17 potential sites were in the South, five were in the North and Midwest, and five were in the West. A telephone survey of a 25 percent stratified random sample of centers in these 17 cities was conducted to determine whether centers showed distributions of staff/child ratio, group size and staff education required by the Phase II design.

At this stage, available telephone survey data and census data were combined to reduce the eligible sites to six candidates, each of which could sustain a complete experimental design for Phase II. To assure generalizability of findings, each potential site had to be representative of a larger group of cities in the country with similar social and economic characteristics. To this end, the entire set of 29 U.S. Census summary socioeconomic variables was used to cluster all 248 urbanized areas in the United States into a few groups.[2] **Principal components analysis** was employed to compute a "measure of distance" among cities and to group them according to measures of socioeconomic status. On the basis of this analysis, six representative cities were chosen as potential sites:

South	North	West
Atlanta	Chicago	Los Angeles
New Orleans	Detroit	Seattle

A more intensive telephone survey, together with site visits to test the feasibility of study implementation in each of the six cities, resulted in final choice of Atlanta, Detroit and Seattle as sites for Phase II. These three sites were retained in Phase III.

Description of Sites

Purposeful selection of sites resulted, as intended, in demographic and regulatory diversity across sites.* Of the three sites, Atlanta had the highest proportion of female-headed families (12.4%), followed by Detroit (11.2%) and Seattle (9.3%).** Only Seattle fell below the national average of 11 percent. Among women over 16 years of age, the highest percentage employed was in Atlanta, and this difference was even more pronounced among mothers of children under six: in Atlanta, 48.8 percent were employed; in Seattle, 29.5 percent; and in Detroit, 22.5 percent. Nationally, 31.1 percent of women over 16 with children under six are employed. Atlanta residents had the lowest mean family income ($12,160), followed by Seattle ($13,233) and Detroit ($13,532). In addition, the highest percentage of families fell below the poverty line in Atlanta.

This pattern strongly suggested that Atlanta had the greatest potential demand for subsidized day care services. That this was indeed the case is borne out by NDCS cost data. In the Atlanta centers participating in the study, public funds accounted for 56 percent and parent fees for 22 percent of average monthly income. (The remainder is principally from cash and in-kind contributions.) Parent fees, on the other hand, are the primary source of center income in Detroit (76%), whereas public funds represented only 14 percent. In Seattle, 42 percent of center income was from parent fees and 28 percent from public funds.

The three sites also differed in regulatory climate. Although during the time of the study state regulations in all three sites addressed issues such as space requirements, staff qualifications, safety standards and the like, Georgia's regulations were so detailed that they almost constitute a manual for setting up and running a day care center. In contrast, Michigan's regulations were brief and applied to nursery schools as well as to day care centers. Thus no statutory distinction was made in Michigan between a preschool, where children are cared for only a few hours a day, and a day care center, where children spend a much longer period of each day. Washington, unlike Michigan, had no regulations for nursery schools, and Washington day care regulations did not go into the detail of the Georgia regulations concerning the finer points of what happens to a child while in care.

All three states specified staff/child ratio by age of child, although none of the required ratios were as stringent as those mandated by the FIDCR. Only Georgia regulations specified maximum allowable group size according to age of child. The three states' staff qualifications requirements also varied. Georgia required that both directors and classroom staff show evidence of recent training in child care, although this training did not need to be in a degree program. Michigan required that the center director have a minimum of two years' study at the college level, and regulations are currently contemplated that will require directors to have 12 credit hours in child development, child psychology and/or early childhood education. Washington regulations specified that program supervisors must have two years' background and experience in programs serving children and must have accumulated 45 credit hours of college or other training in child development (or have a plan to obtain such training). Washington recently recognized the new Child Development Associate (CDA) Credential as meeting the training requirement.

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* A detailed description of the NDCS sites appears in Volume IV-A of the NDCS Final Report.[3]

** Demographic data presented here are based on 1970 census data: women's labor force participation rates therefore appear lower here than the national figures reported in Chapter One.

Implementation of both Title XX and the FIDCR varied from site to site. At the time the sites were selected for the NDCS, Georgia required that centers serving federally subsidized children comply fully with the 1972 draft version of the FIDCR which was never adopted by HEW. The State of Washington had established no separate system of monitoring centers specifically for compliance with the provisions of the 1968 FIDCR, relying instead on existing licensing personnel; as elsewhere, compliance was never vigorously sought. In contrast, Michigan had initially responded to the FIDCR by seeking and receiving a limited waiver from all FIDCR provisions for some of its centers. In 1969, three levels of certification were established in Michigan – full compliance with the FIDCR, waivered certification, and noncertification.* Centers in full compliance were permitted to serve any number of federally subsidized children to capacity; and, of course, centers not certified could serve no subsidized children. However, when Title XX was implemented and the FIDCR staff/child ratio requirement suspended, this system was dropped, and the state no longer required that centers serving subsidized children meet the FIDCR staff/child ratios, although these centers were asked to comply with the other provisions of the 1968 FIDCR.

With the advent of Title XX, Georgia decided to contract with centers for provision of subsidized care; children eligible for such care could be sent only to centers already under contract to the state. This practice differed from that of the other two sites, where parents of children eligible for subsidized care could enroll their children in any licensed center. After the children were enrolled, the center contracted with the state for reimbursement. Thus, parents of eligible children in Seattle and Detroit had a greater degree of choice in determining which center best met their individual needs than did parents living in Atlanta.

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* The intention of the waiver provision was to help stimulate a broader supply of subsidized child care, and to allow nonurban centers to serve the few children that might be eligible for subsidy in their locale without having to make major alterations in center practices.

Sites also varied in the amount and type of training that was readily available. In all three sites it was possible to obtain training in day care at the college level, but only in Atlanta was training available that was designed specifically to meet minimum day care licensing standards. This training program, offered by the State Board of Education through the Atlanta Area Technical School, consists of two basic courses in day care skills and child development. It must be taken by all caregivers within at least three years of center employment. The Atlanta Area Technical School also offers a two-year post secondary program for day care workers as well as a training course in administration for day care directors.[*] Other day care programs in Atlanta include a graduate program for day care directors at Georgia State University and undergraduate courses in day care at Atlanta University. In addition, the Georgia Department of Human Resources provides workshops run by its licensing consultants for staff in day care centers.

In Seattle, day care training is primarily provided by the community colleges. Seattle Central Community College has a two-year program of day care training, and five other community colleges offer day care courses, as does Rentnor Vocational School. The community colleges have also sponsored workshops for day care staff and provided in-service training. The Puget Sound Association for the Education of Young Children, 4-C's[**] and the Seattle Child Care Resource Center have also been important sources of training outside the educational institutions.

In Detroit, two-year programs are offered by Wayne State University, Wayne County Community College, Highland Park Community College, Madonna College, Mercy College, Marygrove College and Schoolcraft College. Madonna College also has a one-year program for child care aides. In addition, the Merrill-Palmer Institute trains students to work in day care centers.

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[*] The basic course and two-year Atlanta Area Technical School program are described in note 9 to Chapter Six.

[**] 4-C's, originally an abbreviation for Community Coordinated Child Care, was formed to coordinate children's services within communities, acting as a liaison among agencies, providers and parents; in many locations, 4-C organizations have broadened their functions (in some cases moving into direct services) and altered their formal titles, but are still known as 4-C's.

SELECTION AND DESCRIPTION OF CENTERS

After Atlanta, Detroit and Seattle were established as study sites, it was possible to complete the selection of the centers which would constitute the NDCS sample. This selection process is outlined below, and the Phase III study centers are described.

Selection of Centers at the NDCS Sites

Within sites, centers were initially selected to meet the requirements of the Phase II natural study design of eight different center types with high or low values for each of the major policy variables (see Figure 2.3). A deliberate effort was made to enlist centers that varied widely not only in staff/child ratios, group sizes and staff qualifications but also in other characteristics. To insure coverage of the policy-relevant range for each policy variable, data from the telephone survey and site visits were used to select Phase II centers in which levels of regulatable characteristics varied from minimum standards set by state licensing requirements to the more stringent levels required by the FIDCR. Centers were also selected to vary as much as possible in nonregulatable characteristics. For example, efforts were made to recruit centers that operated under a variety of auspices and drew their funds from different sources, both public and private.

Diversity was also sought among the children and families served by study centers. Centers serving substantial numbers of both black and white children were included, both integrated centers and those serving predominantly black or white children. Similarly, the sample was selected to include centers serving both low- and middle-income families and therefore to include substantial numbers of children supported by public subsidy as well as children supported by parent fees.

Description of Phase III Centers

At the beginning of Phase III, approximately 1600 three- and four-year-old children were enrolled on a full-time basis in the 57 study centers.* About 300 staff were employed as teachers or aides in the study's target classrooms – those serving primarily three- and four-year-old children.* Most Phase II centers were retained in Phase III, though some centers were dropped and others were added to meet Phase III design requirements.[4]

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* For purposes of summary, classrooms from the 49-center study and the eight-center APS supporting study are described together in this section. Important differences between the two samples are noted where relevant.

As intended, Phase III centers showed a broad range of configurations of **classroom composition.**** Across all 57 centers, observed group sizes ranged from eight to 36, with an average of 17.6 children per group (Figure 3.1A). Most centers (75%) had group sizes between 12 and 24. **Number of caregivers** per classroom ranged from one to more than five, with an average of 2.4; most classes had three or fewer caregivers (Figure 3.1B). Observed staff/child ratios in target classrooms averaged 1:6.8, with a range from 1:4.2 to 1:16.4, although most centers (85%) had ratios between 1:5 and 1:9 (Figure 3.1C).

Table 3.1: Distribution of Center-Level Averages of Classroom Composition Variables

	NDCS CENTERS[a]					Centers Nationally[b]
	Breakdown by Site				NDCS Centers	
	Atlanta		Detroit	Seattle		
	APS (N=8)	non-APS (N=20)	(N=13)	(N=16)	(N=57)	(N=3167)
Classroom Composition (Observed)						
Group Size (Number of children)	17.0	16.9	20.0	16.7	17.6	13.8
Number of Caregivers/ Classroom	2.5	2.6	2.6	2.1	2.4	c
Staff/Child Ratio	1:6.3	1:6.3	1:7.4	1:7.2	1:6.8	1:6.9

[a] NDCS policy variable data are for target three- and four-year-old classrooms averaged to the center level.

[b] Based on NDCS Supply Study data averaged to the center level. The composition variables are based on classroom data from classrooms nationally meeting NDCS target classroom criteria, and have been adjusted for absenteeism.

[c] Group-by-group data on the number of caregivers per classroom are not directly available. An approximation can be derived by multiplying group size by staff/child ratios.

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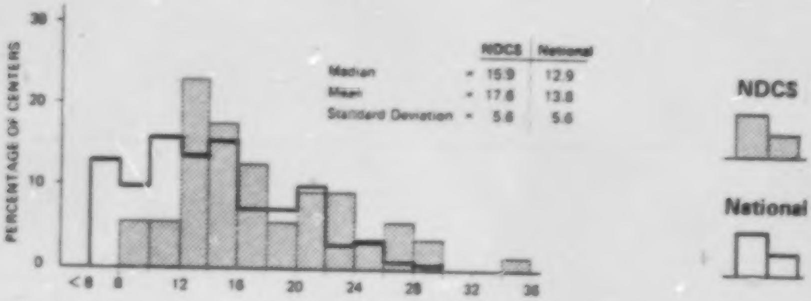
* Total enrollment in these classrooms was approximately 2300 children, including children under three and over four.

** A comparison of the NDCS sample and the Supply Study national sample of centers on the major policy variables is presented in the final section of this chapter. A description of other center characteristics nationally is presented in Appendix A of this volume and Volume III of the NDCS Final Report.[5]

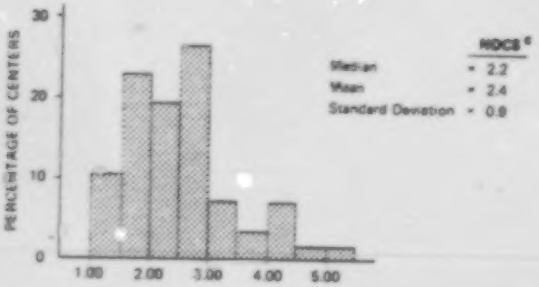
Figure 3.1 Distribution of Classroom Composition Measures (Observed [a]) for the NDCS and Nationally

(Center Level: NDCS N = 57; National Sample N = 3167 [b])

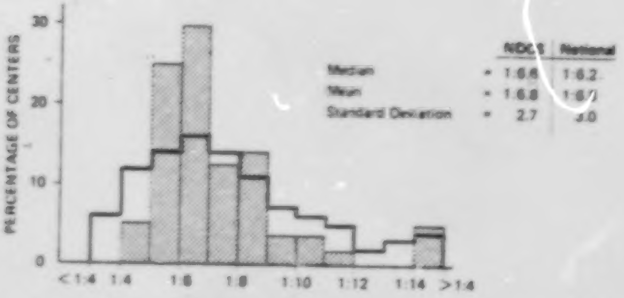
A. GROUP SIZE



B. NUMBER OF CAREGIVERS



C. CAREGIVER/CHILD RATIO



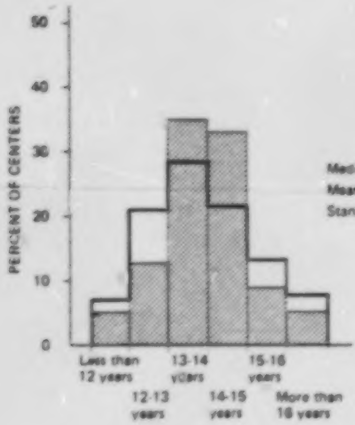
[a] Observed group size is smaller (and therefore ratio higher) than enrolled group size and ratio, by about 12% due to child absenteeism.

[b] NDCS measures of classroom composition were taken by observation; the NDCS Supply Study gathered enrollment and planned staffing data in its survey of 17.3% of all centers nationally. These data have been adjusted for child absenteeism for the purposes of comparison.

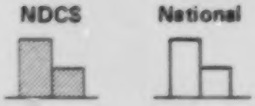
[c] Data not available for the national sample.

Figure 3.2 Distribution of Caregiver Qualifications Measures
Education and Training Variables for the NDCS and Nationally
(Center Level: NDCS N = 57; National Sample N = 3167)

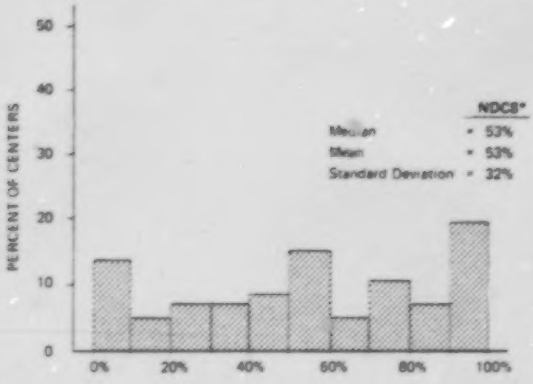
A. YEARS OF EDUCATION



		NDCS	National
Median	=	13 yrs 11 mos	12 yrs 9 mos
Mean	=	13 yrs 10 mos	13 yrs 4 mos
Standard Deviation	=	1 yr 3 mos	1 yr 5 mos



B. PERCENTAGE OF STAFF WITH CHILD-RELATED TRAINING OR EDUCATION



		NDCS*
Median	=	53%
Mean	=	53%
Standard Deviation	=	32%

*Data not available for the national sample.

Staff/child ratios were roughly comparable across sites, although Atlanta centers (both APS and non-APS) tended to have somewhat higher ratios than Detroit or Seattle centers (Table 3.1). Detroit centers tended to have appreciably larger groups than did Atlanta or Seattle centers. Seattle had the fewest caregivers per class.

The typical caregiver had completed high school and had slightly less than two years of post-secondary education (Figure 3.2A). On the average, half of the observed caregivers had received specialized training/education in child-related areas, although substantial variation existed in this dimension (Figure 3.2B). In general, caregivers in the NDCS had less than one year's experience in other centers (Figure 3.3A); by far the largest part of caregivers' day care experience was in their current center (Figure 3.3B).

Educational attainment was comparable across sites (Table 3.2). More marked site variations were found in the proportion of caregivers with child-related education/training; APS centers had heavy concentrations of such caregivers. This high degree of "specialization" in the APS sample is a function of Georgia's requirement that day care workers complete state-sponsored courses in day care within three years of beginning employment, as well as the APS policy of hiring lead caregivers with associate's or bachelor's degrees in early childhood education.

Sixteen of the 57 centers (28%) were racially integrated, where "integrated" centers are defined as those with enrollments between 20 and 80 percent black (Table 3.3). Nine centers (16%) were predominantly (more than 80%) white, and 32 centers (56%) were predominantly black.

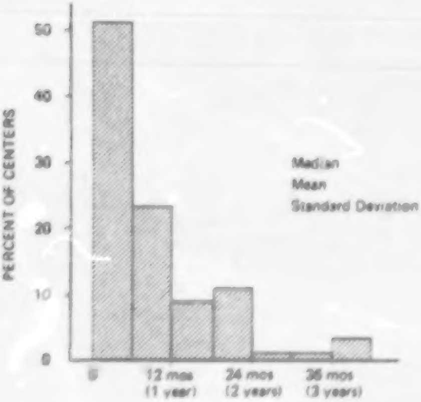
Ten of the 57 centers (17.5%) were operated for profit, while the remaining 47 (82.5%) were nonprofit centers. Of the latter, 13 were operated by voluntary agencies, eight by public schools (the APS centers), 17 by churches, three by Head Start and six by private individuals (see Table 3.3).

Virtually all classroom staff in the 57 study centers were female. Of the caregivers actually observed in the classroom during Phase III, half were white and half were black. Their mean age was approximately 33 years, but there was considerable variation in the sample.

NDCS centers tended to be located in areas of high day care demand; the typical center was in a census tract in which about half of the women were in the labor force in 1970. Approximately 18 percent of the families in census tracts surrounding study centers fell below the poverty line in the 1970 census.

Figure 3.3 Distribution of Caregiver Qualifications Measures
Experience Variables for the NDCS and Nationally
(Center Level: NDCS = 57; National Sample N = 3167)

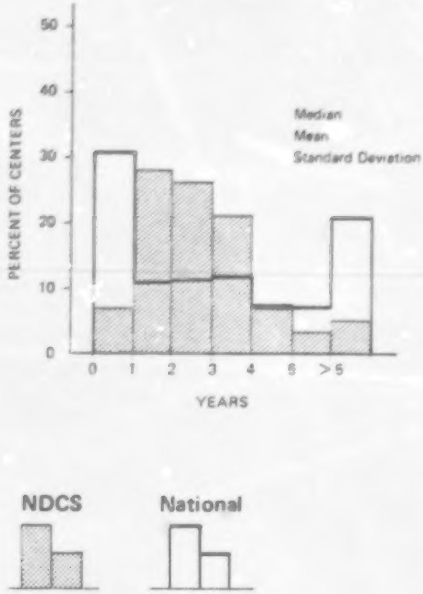
A. MONTHS OF DAY CARE EXPERIENCE PREVIOUS TO EMPLOYMENT IN CURRENT CENTER



		NDCS[a]
Median	=	6 mos
Mean	=	9 mos
Standard Deviation	=	10 mos

[a] Data not available for the national sample.

B. YEARS OF EXPERIENCE IN CURRENT CENTER



		NDCS	National
Median	=	2 yrs 3 mos	2 yrs 3 mos
Mean	=	2 yrs 9 mos	3 yrs 8 mos
Standard Deviation	=	1 yr 6 mos	4 yrs 2 mo

Table 3.2: Distribution of Center-Level Averages of Caregiver Qualifications Variables

	NDCS CENTERS[a]				NDCS Centers	Centers Nationally[b]
	Breakdown by Site					
	Atlanta		Detroit	Seattle		
	APS (N=8)	non-APS (N=20)	(N=13)	(N=16)	(N=57)	(N=3167)
Caregiver Qualifications						
Years of Education	13 yrs, 8 mos	13 yrs, 5 mos	13 yrs, 11 mos	14 yrs, 6 mos	13 yrs, 10 mos	13 yrs, 4 mos
Percent of Caregivers Staff with Child-Related Education/ Training	85%	56%	29%	53%	53%	NA[c]
Previous Day Care Experience	12 mos	9 mos	6 mos	9 mos	9 mos	NA[c]
Experience in Current Center	3 yrs, 6 mos	3 yrs, 3 mos	2 yrs, 5 mos	2 yrs	2 yrs, 9 mos	3 yrs, 8 mos

[a] NDCS policy variable data are for target three- and four-year-old classrooms averaged to the center level.

[b] Based on data from all classrooms nationally, regardless of age.

[c] Information not available.

Table 3.3: NDCS Centers: Summary Data (N = 57 Centers)

	Number of Centers	Percent of Sample
Integration		
Integrated centers (20-80% black enrollment)	16	28
Predominantly black (more than 80% black enrollment)	32	56
Predominantly white (more than 80% white enrollment)	9	16
Legal Status		
For-profit centers	10	17.5
Non-profit centers	47	82.5
Operated by voluntary agencies	13	
Operated by public schools	8	
Operated by churches	17	
Operated by Head Start programs	3	
Operated by private individuals	6	

DESCRIPTION OF TARGET CHILDREN AND FAMILIES

As indicated above, every attempt was made to achieve wide diversity in the types of children and families served by NDCS centers, while still adequately representing children from low-income working families because of their special policy relevance. Examination of the socioeconomic characteristics of children and families in the study sample show that these efforts were successful. Most of this background information was collected from parents at the start of Phase III and was available for almost the entire sample of children who were observed and tested.*

Slightly over half of the target families were single-parent households. Three-fourths of all mothers were employed either full- or part-time and the remainder were in school or a job-training program. About 90 percent of the fathers present in the home were employed. More than a quarter of the sample families received some welfare assistance, but welfare was the primary source of income for fewer than one family out of six. About half of the families in the sample had incomes under $6,000, 27 percent had incomes between $6,000 and $15,000, and the remainder had incomes over $15,000.**

Approximately 65 percent of all children were black, 30 percent were white, and a small fraction were of other racial origins.

Educational backgrounds of parents spanned a wide range. About 19 percent of fathers and 20 percent of mothers had not completed high school; 36 percent of fathers and 39 percent of mothers had high school diplomas only. The remaining parents had varying amounts of postsecondary education, ranging up to Ph.D or other professional degrees. About 10 percent of fathers and six percent of mothers had bachelor's degrees or higher.

EVALUATION OF THE SAMPLE

Two questions are paramount in evaluating the NDCS sample. First, was the sample adequate to permit detection of effects of the major policy variables – staff/child ratio, group size and staff qualifications? And, second, was the sample sufficiently representative of centers affected by federal policy to provide an adequate basis for generalizing results to federally subsidized care across the nation? Both questions can be answered affirmatively, with some minor qualifications.

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* All data presented in this section are drawn from Phase III, except for information on employment of parents and sources of income, which was collected only in Phase II.

** Sample data on income levels were collected in Phase II, from September 1975 to September 1976. Income figures are therefore stated in 1975-76 dollars. It should be noted that a number of centers enrolled both children eligible for public subsidy and children of fee-paying parents. As far as could be determined only eligible children were supported by Title XX funds.

Power to Detect Effects

The capacity to detect effects of the major policy variables depends on four characteristics of the sample: (1) adequate variation on each policy variable; (2) absence of confounding relationships among the policy variables; (3) absence of confounding relationships between the policy variables and other potential determinants of process and outcomes, such as socioeconomic characteristics of children being observed and tested; and (4) adequate size of the sample.

The first of these conditions was clearly met in both the Phase II and Phase III studies. As already indicated, NDCS centers spanned the full range of levels of the policy variables that might be embodied in federal policy decisions. Staff/child ratios ranged from current FIDCR levels to the levels mandated by most states. Group sizes ranged well above and below current FIDCR levels. Staff education also varied widely, from centers with staff averaging less than a high school diploma to centers with staff averaging more than a college degree; as did staff experience, from a few months to several years. Although centers with more extreme characteristics certainly exist (e.g., centers with ratios as high as 1:3, or as low as 1:25) and while inclusion of such extreme centers would have increased the likelihood of finding effects, such extremes do not represent viable options for federal policy and were therefore excluded from study.

The second and third conditions were also adequately met, although the policy variables were not completely independent of one another, nor of background factors that also potentially affect center processes and developmental outcomes. Table 3.4 shows **correlations** among the major policy variables across the 57 Phase III centers.* The table indicates that the classroom composition variables are essentially uncorrelated with the caregiver qualifications variables, indicating that their effects can be easily separated. Within the cluster of qualifications variables, modest correlations exist – high enough to warrant caution in interpreting individual effects, but not high enough to preclude identification of the most powerful variable(s). A similar modest correlation exists between group size and staff/child ratio. Only one variable is so confounded with others as to preclude separation of its effects: number of caregivers is closely related to both ratio and to group size. (As discussed in Chapter Four, strong links between number of caregivers, on the one hand, and group size and ratio on the other, are unavoidable, given mathematical properties of the three variables and the distribution of these three characteristics in the day care world.)

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* In Tables 3.4 and 3.5, data for the entire Phase III sample are pooled for illustrative purposes. Most actual analyses were based on either the 49-center data base or the APS data base separately. All effects analyses were preceded by examination of correlations among independent variables in the relevant data set. Such examination was essential to check how successfully the experimental manipulation and/or balancing of independent variables had reduced confounding among these variables.

Table 3.4: Correlations among the Major Policy Variables (N = 57 Centers)

	Number of Caregivers	Staff/ Child Ratio	Years of Education	Child-Related Education/ Training	Previous Day Care Experience	Experience in Current Center
Classroom Composition						
Group Size	.66	–.26	–.05	.08	.04	–.14
Number of Caregivers		.56	–.00	.07	.19	.03
Staff/Child Ratio			.05	.00	.21	.19
Staff Qualifications						
Years of Education				.34	.18	–.27
Child-Related Education/ Training					.25	–.23
Previous Day Care Experience						.03

Table 3.5 shows relationships among the policy variables and a set of background variables describing the children, families and communities served by the NDCS centers. Again, many correlations are small, indicating that effects of policy variables can easily be separated from those of particular background factors. Some moderate correlations do exist, however. Perhaps most important are the associations of staff/child ratio and staff experience in current centers with various indices of socioeconomic status: high ratios and experienced staff are found in centers serving low-income families and neighborhoods, as well as children of less educated mothers, often from single-parent families. This pattern of associations is tied to federal funding. Low-income children are served in federally funded centers, which are subject to higher FIDCR ratio requirements and which pay slightly higher wages and experience lower staff turnover rates than do parent-fee centers.

The implication of this pattern of relationships is that, for any outcome measure that is affected by background factors such as socioeconomic status, effects of such factors must be removed statistically in order to identify any effects of staff/child ratio or staff experience. (This practice was consistently followed in all of the effects analyses reported in Chapter Six.)

Table 3.5. Correlations among Policy and Background Variables (N = 57 Centers)

	Mothers' Education	Fathers' Income	Proportion White Children	Number of Adults In Home	Poverty of Surrounding Neighborhood
Classroom Composition Observed					
Group Size	.03	–.04	–.16	–.04	.00
Number of Caregivers	–.15	–.28	–.17	–.28	.25
Staff/Child Ratio	–.22	–.31	–.03	–.31	.32
Staff Qualifications					
Years of Education	.08	.14	.24	.08	–.11
Child-Related Education/Training	–.08	–.19	–.11	–.05	.30
Previous Day Care Experience	.05	–.16	.04	–.06	.09
Experience in Current Center	–.21	–.27	–.26	–.32	.38

The final condition required for detection of the effects of the policy variables – adequate sample size – was examined statistically in planning Phase III. Computer simulation was used to estimate the likelihood that effects of varying sizes could be detected, given the projected sample size. Results of these provisional analyses, which were conducted solely for planning purposes, indicated that the sample would allow detection of effects due to differences in center characteristics, as long as these effects were reasonably large relative to total variation from center to center – specifically, as long as at least 14 percent of total center-to-center variation could be explained by the policy variables. These provisional analyses were in effect confirmed by Phase III findings, which revealed many significant and systematic relationships among the policy variables, behavior and test scores.

Representativeness of the Sample

NDCS centers were chosen to meet specific design requirements. They were not sampled randomly from the national population of day care centers, and therefore could not be expected to show *proportional* representation of all of the different types of centers nationwide. In fact, the study's selection criteria guaranteed that the sample would include more than the national proportion of those types of centers of greater policy relevance (e.g., large centers, centers serving three- and four-year-olds, publicly funded centers) and less of others.

It was important to establish the generalizability of the NDCS sample. In order to provide an adequate data base for shaping federal policy, it was not necessary that the Phase III sample show proportional representation of all of the different kinds of centers that exist nationally, nor even of those centers that receive federal funds. It was, however, necessary that the sample include enough representatives of each type of center that receives federal funds to be sure that effects of the policy variables could be estimated for each of those center types.

To determine whether the NDCS sample was representative in the latter sense, a cluster analysis of urban centers from the Supply Study national sample was conducted.[6] The purpose of this analysis was to determine whether centers can be grouped into well-defined types, having particular configurations of characteristics. Center characteristics examined in the cluster analysis included primary source of funding (government or nongovernment), number of years open, total staff size, enrollment, percent of black children enrolled, mean caregiver experience, mean caregiver education, staff/child ratio, capacity, age of oldest child, age of youngest child and profit or nonprofit status.

The analysis showed that day care centers are not easily divided into discrete types. Center characteristics were not so strongly correlated that most or all centers fell into a small number of categories. Nevertheless, it was still possible to group centers into a number of alternative classifications incorporating from two to five center types. Evaluation of the NDCS sample against each of these different center typologies showed that the sample included representatives of all types but one — small, profitmaking, private centers. This cluster was deliberately excluded by the study's selection criteria because such centers serve few publicly subsidized children.

Further analysis indicated that the NDCS center sample is reasonably representative in its distribution of the policy variables, with two exceptions. This fact was illustrated by Tables 3.1 and 3.2 and Figures 3.1, 3.2 and 3.3, which compare average levels of the classroom composition variables in the NDCS sample with averages for comparable classrooms of three- and four-year-olds in the Supply

Study national sample and averages of caregiver qualifications variables in the NDCS sample with averages for all centers nationally. The comparisons show highly similar profiles of means for the two samples, except for group size and experience in current center.

Mean group size in the national sample was considerably smaller (13.8) than mean group size in the NDCS sample (17.6). Further examination of the national sample showed that small groups (12 or fewer children) tend to be found in small centers, which were deliberately excluded from the NDCS sample for reasons stated earlier. However, despite the fact that small groups were *proportionally* underrepresented in the NDCS sample, they were still *substantially* represented. Six Phase III centers had groups with average size of 12 or fewer children, and another 15 centers had groups ranging in size from 12 to 14. Thus the sample included enough centers to estimate costs and effects associated with groups near or below the national mean in size.

As shown in Figure 3.3B, the national sample, compared to the NDCS sample, includes proportionally more caregivers with both very large amounts of experience in their current center (more than 5 years) and very small amounts (less than 1 year). Both of these distributional facts may again be explained by the different selection criteria for the national (Supply Study) sample and the NDCS 57-center sample. The NDCS excluded centers that had been open less than one year, while the Supply Study included such centers — obviously resulting in inclusion of proportionally more caregivers with less than one year of tenure in their current centers. Also, the NDCS excluded centers with enrollments between 13 and 25, while the Supply Study included them. In small centers, directors, who often have much more experience than other staff, frequently function as caregivers, whereas this is less common in large centers. Thus the proportion of caregivers with long experience is higher in the Supply Study sample than in the NDCS sample.

In summary, preschool classrooms in the study centers spanned the range of staff-child ratios, group sizes and staff qualifications most relevant for policy, and they proved to be reasonably representative, with respect to those characteristics of preschool classrooms in day care nationally.

CHAPTER FOUR: THE POLICY VARIABLES

The independent variables (policy variables) of the National Day Care Study (NDCS) – staff/child ratio, group size, staff qualifications and other regulatable center characteristics – posed many problems of definition and measurement.* Present day care regulations, notably the FIDCR but also many state licensing codes and monitoring guidelines, are too imprecise to guide the researcher. Thus, clarification of definitions of center characteristics and choice of specific measures were not only prerequisites for all NDCS analyses of costs and effects, but were also important policy contributions of the study in themselves because of their importance for monitoring and enforcement.

The purpose of this chapter is to explain how the independent variables of the NDCS were defined and measured. The first section of the chapter briefly describes the various data sources available in the NDCS for measuring the policy variables and discusses the criteria used to select measures for the study's cost and effects analyses. The second section of the chapter reviews the major issues surrounding measurement of the classroom composition variables – group size, number of caregivers per group and the resulting staff/child ratio. This section also explains the measurement decisions made in the NDCS and highlights issues related to monitoring classroom composition, which are treated in detail in Chapter Eight and in Part Two of Appendix A. Measures of the caregiver qualifications variables and other regulatable center characteristics studied in the NDCS are discussed in the last two sections of the chapter.

DATA SOURCES AND CRITERIA FOR SELECTION OF MEASURES

[illegible]ata on the major policy variables were collected by a variety of [illegible]thods in Phases II and III. Information on classroom composition was gathered both from center records and through direct observation by NDCS staff. Information on caregiver qualifications was obtained from interviews with caregivers and supplemented by direct

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[1] Measurement of the study's **dependent variables** – center processes, child outcomes and costs – is discussed in Chapters Five and Seven. Background variables, such as the socio-economic characteristics of children served by different centers, were discussed in Chapter Three. While background variables are unregulatable and therefore not of direct policy relevance, their effects must be taken into account in assessing the effects of the policy variables.

observation to determine which caregivers were in the classroom at different times of the day, week and year. Data on the other policy variables were also collected by a variety of methods. Information concerning center philosophies was gathered through interviews with directors and staff; information on the physical environment was collected by direct observation. Data on type and degree of parent involvement, as well as the availability and use of supplemental services, were gathered through interviews with parents and staff.

Measures of the major policy variables were tested against standard research criteria of **reliability** and **validity**. A measurement technique is reliable if it gives the same results when applied by different people on different occasions. A measurement technique is valid if it actually assesses the quantity or quality it is designed to assess. Reliability and validity of measures are important determinants of the potential of any study to detect relationships between variables of interest — in the case of the NDCS, to find links among regulatable center characteristics, selected measures of quality (caregiver behavior, child behavior and test score gains) and measures of cost.

Reliability and validity, however, while dominant research considerations, are not the sole criteria in selecting measures for purposes of regulation and monitoring. Useful measures of the day care environment must not only be precise and unambiguous, but must also be relatively simple, so that compliance can be readily determined by both providers and monitoring agencies. Further, measures must be flexible enough to suit the wide variety of day care situations found in practice — mixtures of parent-fee and publicly subsidized children, open-classroom arrangements with more than one group of children in a single room, and hierarchical staffing arrangements of lead teachers, aides and volunteers. Finally, definitions and measurement techniques must be feasible to implement. They must not impose excessively expensive and time-consuming recordkeeping requirements, and they must not require frequent and/or highly intrusive monitoring of center and classroom operations.

For these reasons, NDCS research interests go beyond the regulatory concerns of government, although common measurement needs are stressed throughout this chapter. Data on center characteristics gathered in the NDCS far exceed the requirements of most monitoring agencies; such in-depth study was needed to arrive at simpler and more policy-relevant descriptions of centers for future regulatory use. Therefore the measures chosen for research purposes, as reported in the following section, are not in all cases identical to the measures recommended for regulatory purposes, which are presented at length in Chapter Eight.

MEASUREMENT OF THE CLASSROOM COMPOSITION VARIABLES

In the NDCS, classroom composition was defined in terms of three variables:

- *number of caregivers*, defined as the total number of caregivers present in or assigned to a classroom;
- *group size*, defined as the total number of children present in or assigned to a class or to a principally responsible caregiver;* and
- *staff/child ratio*, defined as the *number of caregivers* divided by *group size*.

Historically, regulations of classroom composition have focused on ratio and group size, and the required levels have been contingent on the age of the children in care.

At first glance, measuring the three group composition variables seems simple and does not appear to present a serious problem for the researcher. On closer inspection, however, simplicity evaporates. The complexities of measuring classroom composition became increasingly clear over the course of the NDCS both through study of the concept itself and through empirical analysis of the three variables – group size, number of caregivers and staff/child ratio.

Conceptual Analysis

Figure 4.1 illustrates three basic points that emerged from this gradual clarification. The figure shows all possible classroom configurations consisting of groups of five to 25 children, with one to five caregivers and with staff/child ratios between 1:5 and 1:10. These configurations encompass the vast majority of centers both in the NDCS sample and nationally (see Chapter Three).

The first key aspect of classroom composition illustrated is the mathematical relationship among its three components – group size, number of caregivers per class and staff/child ratio. Specifying any two of the three components automatically defines one and only one point on the graph and thus fixes the third component.

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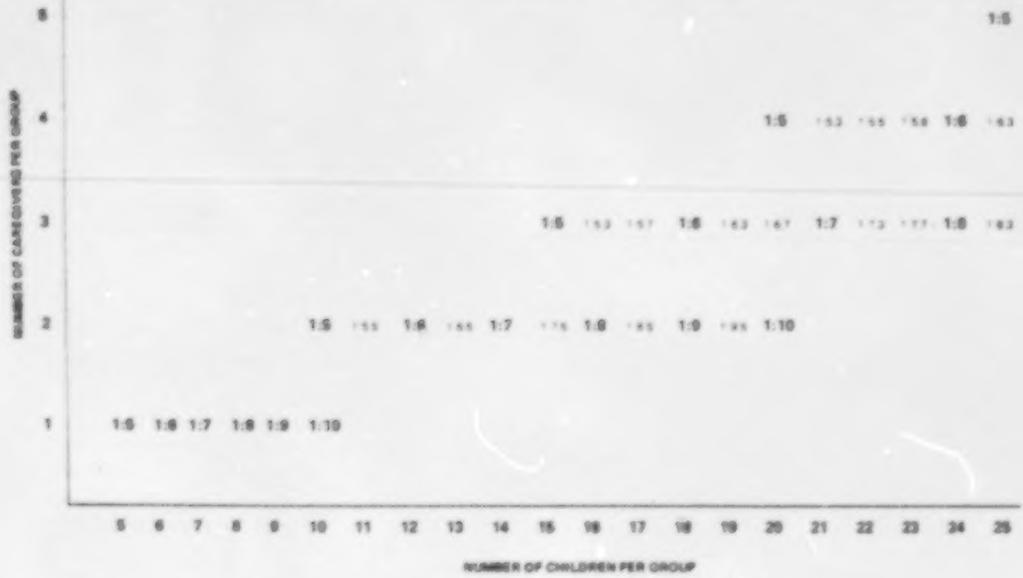
* In all but a few NDCS centers, groups of children were assigned to particular rooms, supervised by a single caregiver or several caregivers. In a few "open classroom" centers, however, very large numbers of children (approaching 100 in extreme cases) were present in a single large room. Even in such centers, children clustered around individual caregivers or small teams, dispersed around the room, though children were often free to move from group to group. Numbers of children in these smaller groups constituted the group size used for NDCS analytic purposes. Similarly, numbers of caregivers were the number of adults in physically separated groups.

Figure 4.1 Possible Configurations of Classroom Composition for Groups from 5 to 25 Children, with 1 to 5 Caregivers, and Resulting Ratios from 1:5 to 1:10



Moreover, the graph illustrates that there are relatively few configurations of children and caregivers that can exist within the limits of cost and feasibility.

It is also important to note the relationship between number of caregivers and the other two classroom composition parameters. Within the relatively broad ratio band of 1:5 and 1:10, as group size increases, there is a corresponding increase in number of staff. This relationship, which characterizes both the NDCS sample and centers nationally, makes it difficult to disentangle effects associated with these two elements of classroom composition: effects that are tied to group size also tend to be linked to number of caregivers, and vice versa. Similarly, number of staff and staff/child ratio are associated, so that their effects are also difficult to separate.[1]

A third point, important in light of the heavy regulatory emphasis that has traditionally been placed on staff/child ratio, is that identical ratios are "embedded" in groups of widely varying size, with group dynamics that are potentially very different. As illustrated in Figure 4.1, a ratio of 1:5 can represent several different real-life classrooms: one caregiver with five children, two caregivers with ten children, three caregivers with 15 children, four caregivers with 20 children or five caregivers with 25 children.[2] Although these classrooms have identical ratios, their associated behavioral dynamics may vary markedly over the range of group sizes and number of staff.

Measurement Issues

Analysis of the concept of group composition and definition of its three elements uncovered several important measurement issues.

- Which data source – center records or direct observations – should be used for measurement of classroom composition;
- How can fluctuation of classroom composition variables, resulting from regular changes in daily activities and from varying schedules of part-time children and part-time volunteers, be dealt with?
- Do average values of group size, number of caregivers and staff/child ratio characterize classes and centers reliably and accurately?

Data Sources: Observations versus Schedules

Two basic strategies for measuring group composition are available to the researchers and the monitor: reliance on center records or schedules, and reliance on direct observation of the classroom.[3] Each method has distinct advantages and disadvantages.

Observations are inherently valid indicators of classroom composition. Except for the negligible influence of counting errors, they represent classroom reality directly, and they automatically take account of absenteeism. However, they have a potential disadvantage: they give accurate information about group composition at a particular time, but this information may not be accurate for other times of the day, week, month or year. This issue will be discussed in a later section.

Unlike observations, center records – both prospective and retrospective – give information spanning a broad period of time, and they are easily monitored. Prospective (planned or scheduled) records reflect the center's planning process, but they do not take account of absenteeism or other unplanned changes in schedule, such as merging of classes or movements of caregivers or children from one class to another. They are not particularly useful when there is no planned assignment of children to groups, as in some open classroom centers. Very detailed retrospective (after-the-fact) records can provide accurate information on variations in grouping patterns across the day and week and absence rates for staff and children. However, such records require careful and frequent updating.

Thus, center records cannot be relied upon to correspond to the classroom reality reflected in observations. An important issue surrounding the choice of a measurement strategy is therefore the degree of correspondence between recorded and observed group composition parameters. To examine this issue, schedule-based and observation-based information was collected in parallel throughout the NDCS.

Schedule-based measures were constructed in the following manner.

- Five times during the course of the Phase III day care year (in October, December, January, March and April), centers provided detailed standardized records of the number of hours per week that children and staff in target classes were scheduled together at the center.*
- Hours were counted for all children scheduled for target classrooms for at least one hour per week.
- Volunteers were counted only if they were scheduled for 10 or more hours per week in a target classroom.
- Schedule-based *group size* was defined as the total number of scheduled child hours in each target classroom divided by 40, thus representing group size in terms of full-time equivalent (FTE) children.
- Likewise, schedule-based *number of caregivers* was defined for each group as the total number of scheduled caregiver hours divided by 40.
- Schedule-based *ratio* was defined for each group as the (schedule-based) number of caregivers divided by the (schedule-based) group size.
- Each schedule-based variable was adjusted for the amount of time individual children and staff members were absent by monitoring each person for absenteeism on 12 days distributed throughout the day care year.

Observation measures were collected independently by SRI and Abt Associates in Phase III.

- SRI measured classroom composition as part of its October and April child-focus and adult-focus observations. Every 5 to 20 minutes the observer recorded the number of children and number of adults present.
- Abt Associates measured classroom composition using an instrument and schedule specifically designed for this purpose. Observations were conducted for four days during the week immediately preceding or following collection of the schedule-based data (in October, December, January, March and April). Two observations were systematically obtained for each hour of the day (between 9:00 a.m. and 5:00 p.m.) for every target class. All children and adults present at the time (except bystanders) were counted.

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* No data were collected during summer months, which in Phase II had shown program, staffing and enrollment patterns quite distinct from the rest of the year.

- Because observations systematically distributed over time automatically adjust for part-time children and staff and for absenteeism, no such adjustments of the observation counts were made.

Schedule-based and observation-based measures of classroom composition were not always in close agreement, although none of the disparities which were noted rule out the possible use of schedules for monitoring purposes. Differences between the two were primarily attributable to two phenomena: absenteeism and the merging of classes. These are common occurrences in day care environments; varying proportions of children and staff are absent at any center, and many centers combine some or all of their classes during certain activities.

Absences appear to be random. Centers were found to have relatively similar absence rates, averaging 12 percent for children and 7 percent for staff across the 57 study centers. Consequently, when not adjusted for absenteeism, schedule-based measures overestimate the numbers of children and caregivers actually present in each classroom. After adjustments for absenteeism, however, NDCS analyses showed a reasonably high degree of correspondence between scheduled and observed group size and between scheduled and observed number of caregivers in each class, but only when classes were not merged.[4]

Merging, in contrast to absenteeism, is relatively unpredictable for most centers: of the 24 study centers which were observed to merge classes, only six did so regularly throughout Phase III.[*] Not surprisingly, when a class was merged, observed group size and the number of caregivers were much higher than indicated in the schedule, although observed and scheduled staff/child ratio were fairly comparable.[5]

Because observation-based measures are inherently valid and sensitive to phenomena such as absenteeism and merging, the NDCS used them in its effects analyses. Observations collected by Abt Associates (averaged over the day care year) were used in analyses of children's test scores, because they reflected the classroom environment to which children were exposed over the entire fall-to-spring testing period. The more "immediate" measures of group composition obtained as part of the SRI child-focus and adult-focus observations were used in analyses of child and caregiver behavior, because they reflected classroom dynamics at the time behavior was observed.*

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[*] Merging is "unpredictable" only in the sense that external monitors cannot usually determine from previous visits whether classes will be merged during subsequent visits. Center staff, of course, know when they will merge classes, although this decision is often made spontaneously or intermittently and not as a recurring feature of weekly activities.

Fluctuations of Classroom Composition over Time

In essence, change is the dominant characteristic of classroom composition. An individual center is a dynamic environment of comings and goings, groupings and regroupings, functions and activities. Children and caregivers arrive and leave at different times.

Variation in activities over the course of the day is the first important source of fluctuation. Though many of these changes in group composition are random, there are patterns linked to the various activity periods: arrival and breakfast; morning planned group activities and/or free play and snack; lunch; nap; afternoon free play or individual activities and snack; and departure. Classroom composition was found to vary substantially across these time segments.[6] Within any given activity period or segment of the day, however, classroom composition varies very little across days of the week or months of the year.[7] For example, a single morning of observation during the period 9-12 a.m. proved to be a reliable indicator of group composition for that time block across the entire week or even month during which the observation was made.** Observations during morning hours were also predictive of group composition during other periods of the day, but much less strongly so.

The most stable period of the day, and also the period most linked with planned educational activities, was during the morning hours from 9 a.m. to 12 noon. All full-day children have generally arrived by nine and few children leave before lunch. Learning activities, songs, story time and other such planned events take place almost universally some time during this three hour period. It was for these reasons that *the NDCS effects analyses used average composition measures taken during the morning hours over many separate occasions.*

The second major source of fluctuation in classroom composition is part time staff and children. In some centers, the same caregivers are present with the same children all day, all week, and all year; in other centers, many staff and children are part-time. Some centers experience rapid turnover of staff and children. Some centers, such as parent cooperatives, have many volunteer staff; others have none. Almost all centers have staff who do most of their work outside the classroom – administrators, cooks, janitors – but many of whom also double as part-time classroom staff. These variations in the number of staff and children present must be addressed and dealt with uniformly in constructing classroom composition measures.

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* Unlike effects analyses, discussed in the foregoing paragraphs, *NDCS cost analyses used schedule-based rather than observation-based measures of classroom composition.* Averages of schedule-based measures, adjusted for absenteeism, were used for cost analyses because costs were calculated for the center as a whole and were not imputed to particular classrooms (see Chapter Seven). Observations, which were confined to target classrooms, did not provide data on children in other groups needed to determine a center's average cost per child.

** This does not mean that an entire morning must be spent observing. In fact, only three or four four-minute observations need be conducted in each classroom, but these should be distributed throughout the morning's activities.

Except as noted above, the NDCS generally counted all adults and children actually present in the classroom in its analyses of classroom composition. The rationale for this approach is that all adults and children contribute to the dynamics of the classroom. Analysis showed that estimates of classroom composition based on observations were not much affected by the inclusion or exclusion of specialists, volunteers and part-time children in the calculations.* These results were true both for observations and for schedule data from the Phase III sample of 57 NDCS centers and for schedule-based data from the larger national sample in the Supply Study.

Reliability and Validity of Classroom Composition Measures

The foregoing discussions make it clear that virtually all useful measures of group composition are *averages* of some sort – averages of many observations over time, averages of scheduled staff and child hours, and so forth.

Because the components of classroom composition fluctuate appreciably during the day, a question arises as to whether these averages reliably characterize classes and centers.[8] Reliabilities of class and center averages of group size, number of caregivers and staff/child ratio were computed using techniques proposed by Cronbach and his colleagues.[9] Results showed that these averages in fact had high reliabilities – most between .93 and .95, and none less than .8. Thus unreliability of independent measures was *not* a significant factor in NDCS analyses of the effects of classroom composition.

In contrast to the marked fluctuation in group composition over time, observed group sizes, numbers of caregivers and staff/child ratios were quite similar across preschool classrooms within centers. Target classrooms – those serving predominantly three- and four-year-olds – were remarkably similar within any given center. There was considerably less variation according to age of child than might have been expected – in fact, almost none. (Classes serving children younger than three or older than five *are* very different in composition from preschool classes, however, as indicated in Appendices A and B).

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* In the 57-center study, for example, the mean number of caregivers present is at most one-tenth of a person higher when volunteers are included in the computations.

The validity of alternative measures of classroom composition has been discussed throughout the preceding sections. For research purposes, observation-based measures were clearly more valid indicators of the child's day care experience. However, schedule-based measures do correspond reasonably well to observation-based measures, when used as they might be used in monitoring compliance. The importance of this finding is considered in Chapter Eight and in the discussion of monitoring implications below.

Implications for Monitoring

Much that is useful for regulation and monitoring was learned in the process of developing adequate measures of classroom composition for research purposes. This discussion highlights NDCS findings on major measurement issues discussed above that have direct implications for regulation and monitoring of classroom composition.

Data Sources: Observations versus Schedules

Although observations are clearly more valid indicators of the child's day care experience, schedule-based measures can be useful in monitoring compliance if two conditions are satisfied.* First, scheduled staff and child measures must be adjusted for absenteeism. Second, schedule-based staff/child ratios should be computed for the center as a whole in order to achieve satisfactory measurement accuracy. The correspondence between observed and scheduled ratios is not very strong at the class level (even for classes which do not merge), but it is substantially higher at the center level.[10] Additional reasons for monitoring ratio at the center level are given in Chapter Eight.

Given the practical advantages and additional information provided by schedules, a monitoring strategy which combines schedule-based and observation-based measures appears to be more desirable than relying on either technique alone.

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* This discussion assumes that regulations for group size will take into account the regular merging of classes that takes place during lunch, nap and outdoor play. If this is not the case, or if frequency of merging at other times is high, then center records maintained for monitoring purposes should include a reasonably detailed retrospective account of the frequency of, and reasons for, merging classes and should identify the classes involved. This information is important not only because it bears on the accuracy of schedule-based measures, but also because (as discussed in Chapter Eight) merging is itself a compliance issue when it produces group sizes which exceed regulated limits.

Fluctuation in Classroom Composition over Time

Observation- and/or schedule-based measures must account for fluctuations in classroom composition across daily activity periods. Regulations governing classroom composition variables should specify the period(s) of the day to which they apply, and monitoring visits and required schedule data should be designed to assess compliance during these periods.

Regulations and monitoring guidelines for classroom composition variables must deal uniformly with variations in center staffing and enrollment patterns. They should specify:

- whether part-time staff and children are to be included in measurements of group size, number of caregivers and staff/child ratios;
- whether volunteers should be included; and
- whether and how adjustments for child and staff absences should be made.

NDCS analyses have shown that the exclusion or inclusion of volunteers in such computations would not generally affect the stringency of classroom composition regulations. (However, individual centers, such as parent cooperatives, could be radically affected by decisions to exclude certain groups from classroom composition measures.) NDCS findings also indicate that part-time staff and children should be included in all computations of group composition if those computations are to yield an accurate picture of conditions actually prevailing in the classroom. However, if such computations are based on schedules, adjustments must be made for the number of hours that part-time staff and children are scheduled to be present in order to bring schedule data into correspondence with observations.

Reliability and Validity of Classroom Composition Measures

The major research criteria of reliability and validity can be as important to the monitor as they are to the researcher. An unreliable technique for measuring staff/child ratio – one that gives different results when applied by different monitors on different occasions – cannot be used to judge whether a center is in compliance with regulations. Similarly, an invalid technique – one that gives consistent but misleading results – cannot be used. For example, center records would be unreliable measures of ratio if the records were kept inconsistently from day to day. They would be invalid measures if they systematically failed to count certain staff (part-time staff or volunteers) or certain children (part-time children or "drop-ins").

Both observation-based and schedule-based measures of classroom composition used in the NDCS have been shown to be reliable and valid. For regulatory purposes, monitoring guidelines for classroom composition variables should specify the span of time to which compliance measurements must generalize and the degree of accuracy required. If, for example, compliance decisions were to be made on the basis of yearly measures, it is likely that information would have to be collected at several time points to achieve reasonable accuracy. A monitoring system in which random monitoring observations are used to verify schedule data periodically submitted by centers appears feasible for such a case.

MEASUREMENT OF THE CAREGIVER QUALIFICATIONS VARIABLES

Perhaps the most crucial "variable" in the child's day care experience is the caregiver. Yet the most important characteristics of the caregiver are the most difficult and complex aspects of day care to define and measure. Personal characteristics such as warmth, maturity, concern, energy, humor, sensitivity, positive attitudes and high motivation are important in working with children of any age and may be critical to successful relationships with three- and four-year-olds. Center directors routinely make intuitive judgments about personal characteristics when they hire, train, supervise and evaluate caregivers. Yet it is difficult to describe individual traits with objective precision, and more difficult still to specify configurations of such traits appropriate for work with children.

For these reasons, state and federal regulations have not focused on personal characteristics, despite their importance, but rather on tangible qualifications – formal education, previous experience and job-related training – which are presumed to predict the caregiver's competence in dealing with children. Because the NDCS was a study of effects of those center characteristics susceptible to regulation, it too focused on variables in the domain of caregiver qualifications: years of formal education (regardless of subject matter or specialization); presence or absence of specialization in a subject area related to children or child care, amount of day care work experience prior to beginning work at the current center; and length of service in current center. All information was gathered through interviews with caregivers.

Years of Education

Information was collected on total years of education, diplomas and degrees obtained, areas of specialization and education currently in progress. Number of years of education was the variable used in virtually all cost and effects analyses. Diplomas and degrees were so highly correlated with years of education as to render the variables virtually indistinguishable.

Child-Related Education/Training

Certain types of special training, received by caregivers in high school, junior college, vocational/technical school, college or graduate school, were directly related to young children. [illegible] This preparation, in almost all cases, involved a combination of classroom instruction and practical work in the field.

Although many caregivers in the sample who had specialized in a child-related area did so in the context of a program of postsecondary education, some received their training in the context of a high school program, and many caregivers in Atlanta took a state-required 60-hour day care course after high school which was not a part of any formal degree program. Thus, presence of CHILD-RELATED EDUCATION/TRAINING (as the variable is called throughout this report) does not necessarily connote a high degree of formal education. Unfortunately, as explained in Chapter Six, the study sample did not permit separation of the effects of child-related training received in context of postsecondary degree programs from effects of training received outside such programs.*

Experience

Two different indices of experience were computed: years of experience in day care previous to the caregiver's current job, and years of experience in the current center. In both cases, years of experience were adjusted to take account of part-time jobs.

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* Other attempts to examine effects of practical field training outside the context of formal education [illegible]

Reliability and Validity of Qualifications Measures

No systematic check on the accuracy of caregivers' reports about their own qualifications was possible within the framework of the NDCS. Thus validity – correspondence of interview measures with reality – must simply be assumed. Reliability, in the sense of consistency of an individual's self-report on different occasions, was not systematically checked and must also be assumed.

However, another important aspect of reliability was checked, at least provisionally. The systematic counts of caregivers and children that were taken over the year included records of individual staff present on each occasion. These records allowed examination of fluctuations in caregiver characteristics over time (e.g., replacement of lead teachers by less qualified caregivers during absences, [illegible] periods) as well as variations in qualifications, both [illegible] within the class and from class to class within the center. [illegible] considerable [illegible]. When [illegible] of center averages were computed by techniques analogous to those described earlier for classroom composition, these reliabilities fell in the .2-.5 range. Thus, analyses of effects of caregiver qualifications on child behavior and test scores (reported in Chapter Six), which were based on class and/or center averages of the qualifications variables, were severely constrained by the reliabilities of those averages; underestimation of the true effects of qualifications on these outcomes is probably the result. In contrast, analyses of links between qualifications and caregiver behavior, based on the individual caregiver as the unit of analysis, were not hampered by these constraints, since the major sources of unreliability – fluctuation of caregiver qualifications over time and variation within classes and centers – do not apply at the level of the individual.

MEASUREMENT OF OTHER REGULATABLE CENTER CHARACTERISTICS

In addition to classroom composition and caregiver qualifications, the NDCS examined a number of other center characteristics as possible determinants of quality and cost. These characteristics included:

- center philosophy and program orientation;
- physical facilities (space, materials and equipment);
- director qualifications;
- stability of caregiver/child relationships;

- availability of basic nutrition and health services;
- availability of specialists and supplementary services; and
- availability of opportunities for parent involvement.

Because the study was designed to highlight costs and effects of the major policy variables, however, these center characteristics could not be studied as effectively as were the major policy variables. For example, centers were chosen to vary across a policy-relevant range of group size; they were not chosen to exhibit wide or systematic variation in physical space arrangements. It was for this reason that preliminary investigation was needed to determine whether a meaningful study of costs and/or effects of space — and all other center characteristics that were not covered in the original design — could be conducted.

These preliminary investigations showed that only two such characteristics — center philosophy/program orientation and physical facilities — could be examined statistically in relation to the study's process and outcome measures.

Center Philosophy and Program Orientation

Over and above the major policy variables, the philosophy of a center and its general approach to the care and education of young children — determined by the center director and caregivers — can affect the dynamics of a classroom. During Phase II, data on center philosophies and curricula were gathered by means of interviews with directors and caregivers. With the help of Abt Associates field staff, who had extensive experience in all of the study centers, data were used to construct a program typology based on expert judgment rather than on a mechanical classification procedure. Programs were first sorted into two mutually exclusive (but not exhaustive) categories, according to whether they emphasized the individual child or the group. In centers with an individual emphasis, staff stressed independence, self-reliance, learning at the child's own pace and making the child feel important or special. In centers with a group emphasis, staff stressed sharing, cooperation, getting along with others and interaction between staff and children.

In addition to this broad distinction between group and individual orientations, centers were categorized according to other program emphases. The latter categories were not mutually exclusive; centers could be placed in several categories if their philosophies or curricula seemed to involve multiple emphases, and the vast majority of centers were in fact placed in two or more categories.

These additional descriptive categories were:

- *ethnic and/or religious emphasis* – applied to centers that stressed spiritual development or the importance of learning to appreciate one's own culture;
- *guidance emphasis* – applied to centers where staff stressed love, warmth, understanding or a "homey" atmosphere;
- *protective emphasis* – applied to centers that saw themselves principally as caring for children's basic needs so that parents could be freed for work or other activities;
- *behavioral supervision emphasis* – applied to centers that stressed obedience, discipline, manners and adult supervision and control; and
- *cognitive emphasis* – applied to centers where staff stressed such activities as language stimulation, teaching ABC's and number concepts, and where the day care classroom was described as preparation for the grade school environment.

Physical Environment

Although most developmental psychologists and child care practitioners agree that the human environment is a more important influence on the growing child than is the physical environment, it is also true that space, equipment and materials can facilitate or impede caregiver-child interaction. In the extreme case, a crowded or inadequately designed facility or ill-chosen equipment and materials can be threats to safety. Although state licensing requirements are generally designed to protect children from grossly unsafe environments, the question remains whether federal regulations might further strengthen these safeguards or even promote environments which influence development in a positive way.

Two sources of data on physical resources were used to address these issues in the NDCS. The Physical Environment Inventory, which is part of a larger instrument designed by SRI to record classroom processes (described in Chapter Five), consists of a checklist noting the presence or absence of different kinds of equipment and materials. In addition, the Inventory has ratings of various qualities of the environment such as the adequacy of space and equipment and the availability of "soft" or manipulable items. Data from the Physical Environment Inventory were combined statistically into a single rating of physical quality for each center. Second, data taken from center space plans were used to compute the amount of space (in square feet) available to each child. Though NDCS centers differed widely along this dimension, they all met or exceeded state licensing requirements regarding indoor and outdoor square footage per child.

Variables Not Included in Cost or Effects Analyses

Remaining variables could not be investigated within the study framework. Director qualifications were closely linked to caregiver qualifications; it was not possible to separate effects of the director's education, training or experience from effects of similar qualifications of staff.

Continuity of care, defined as stability of caregiving arrangements from day to day or week to week, proved to be seriously confounded with other center characteristics and could not be assessed statistically. Continuity in the long-term sense – that is, stability of caregiving arrangements over a period of years – was entirely beyond the bounds of the one-year Phase III study.

Basic nutrition and health services were provided by almost all NDCS centers. A review of menus and snack and meal schedules indicated that children were adequately fed and screened at entry for communicable diseases; at least minimal provisions existed for dealing with sick children. Lack of variation made any investigation of differential effects impossible. Effects on children and families of services such as health care or social services are themselves topics for major and complex research efforts, requiring measurement and data collection techniques very different from those employed in the NDCS to assess effects of the primary policy variables.

Perhaps the most important of the additional center variables whose impacts could not be assessed were supplemental services and parent involvement. Although NDCS staff did examine the availability and use of supplemental services, the degree of parent involvement and parents' desire to participate, it proved impossible to evaluate impacts of such program features. Although it would theoretically have been possible to examine effects of parent involvement and of certain supplemental services (e.g., services of educational specialists) on classroom processes and child outcomes, using data already available from the study's principal effort, such examination was not feasible because of the manner in which these variables were distributed. Availability of services and opportunities for parent involvement were inextricably tied to federal funding and to all of the other center characteristics that accompany federal funding, most notably high proportions of children from low-income families. Thus an attempt to evaluate the impact of services collectively, or the global impact of parent involvement, would merely have been a comparison of federally funded and privately funded centers. Because particular mixes of services and types of parent involvement varied widely from center to center, any attempt to evaluate the impact of any particular service, mix of services or particular program of parent involvement would have been confined to a few centers.

Consequently, the NDCS cannot contribute to the debate over whether or not day care centers should be required to provide supplemental services. It is widely recognized that such "supplemental" services meet *fundamental* needs of all children, and that ideally such services should be provided to all children, in or out of day care. This study did not address the policy questions of whether or not day care is the appropriate vehicle for delivery of such services to some children, and whether federal regulation is the appropriate mechanism to ensure that such services be delivered. The study did, however, yield information on costs of supplemental services, discussed in Chapter Seven.

Likewise, study results do not resolve issues regarding the appropriate form and level of participation by parents – children's best advocates and rightful representatives. However, NDCS Supply Study staff gathered information on the extent to which centers comply with the current FIDCR requirement for parent involvement. In addition, two instruments concerning parental attitudes, which were administered to samples of parents of children in NDCS target centers, yielded some information on parent opinions about involvement in their children's day care experience. (Selected results of these investigations appear in the next chapter.[11])

CHAPTER FIVE: IN SEARCH OF QUALITY

Unlike most previous studies of the impact of group care on young children, the National Day Care Study (NDCS) had a broad mandate: to trace the connections between a wide range of regulatable center characteristics on the one hand and both quality and costs on the other. Of the three domains, *quality* clearly poses the most difficult conceptual and technical problems. Philosophical disagreements as to its definition abound; instruments adequate to measure all of its aspects do not exist. This chapter discusses alternative views of quality and outlines the approach to its definition and measurement adopted in NDCS effects analyses. The chapter also describes variables and instruments used in effects analyses and additional instruments used in supporting analyses.

PERSPECTIVES ON DEFINING QUALITY IN CHILD CARE

Effects and *quality* are not identical, but are intimately linked. The effects of different day care center arrangements are, in principle, objective matters, although they may be difficult to conceptualize and measure. Assessing quality requires that value judgments be placed on different patterns of effects. There are many open questions in the developmental research literature and in the practical lore of child care regarding the objective effects of different center characteristics. There is even more widespread controversy over what is desirable and over the proper roles of the federal government, the state, the local agency, the provider and the parent in choosing goals and taking action to achieve them.

Quality day care has several dimensions: it is a service to working parents, it enhances children's development, and it may be part of a broader range of services to children and parents. Depending on one's point of view, one or another of these aspects may be more or less important. However, the three are not mutually exclusive, but rather complementary. Focusing on any one aspect to the exclusion of the others gives only a narrow and partial picture. All three must be addressed in any comprehensive discussion of quality care. As will be seen, the NDCS approach to measuring quality incorporated elements of all these views.

In the past, day care has often been viewed exclusively as a service to working parents. From this perspective, *quality means meeting the needs of the parent and providing a loving, home-like environment in which the child is safe, adequately fed, active and happy*. Guided by this view, licensing standards of some states and localities focus solely on health and safety, leaving it to the provider and the parent to evaluate and insure the convenience of the facility and the happiness of the child.

A different view of quality – but one that is clearly consistent with the first – has gained momentum in recent years under the influence of Head Start and other early intervention programs. According to this view, *quality should be defined in terms of developmental benefits to the child;* a child care program is good insofar as it promotes social, emotional, cognitive and physical growth. This view has also been reflected in the public domain, both in the Federal Interagency Day Care Requirements (FIDCR) and in the licensing requirements of many states. These requirements generally take the form of relatively strict staffing standards and requirements for activities, play equipment, program goals, and planning, which are felt to be preconditions for any adequate developmental program. Choices about specific program content and practices have, however, been left for the most part to providers and parents.

Finally, a third and very broad view of quality goes beyond the child's daily classroom environment, encompassing ancillary health, nutrition, parent counseling and other services designed to help families function more effectively. According to this view, *quality child care cannot be provided in isolation but must be part of a broader range of services to children and families.* This view is particularly prevalent among those concerned with government-subsidized child care for the poor. It is reflected in the FIDCR provisions for health care, nutritional standards, social services and parent involvement. Again, it is clearly not inconsistent with the other views of quality.

As a practical matter, defining quality involves not only specifying the goals of care – serving parents, providing a safe and growth-supporting environment, stimulating development, or providing a broad range of services to children and families – but also choosing concrete indicators by which quality may be assessed. Parents, providers and policymakers need to know how to judge, from their very different vantage points, the quality of day care centers and what steps they can take to raise or maintain quality.

One approach to assessing and ensuring quality is to be sure that centers have the right *ingredients* – the right staff/child ratio and group size, caregivers with the right kind of training and experience, the right facilities, equipment and materials, the right mix of supplementary services, the right procedures to facilitate parent participation and communication between parents and staff. This approach underlies the FIDCR, as well as most state and local regulations.

A second approach focuses on what actually happens in classrooms and centers, that is, on *processes* – principally on daily interactions between caregivers and children. In this view, the test of quality is not met unless children experience warm, stimulating and challenging relations with caregivers and peers. Nor, for those who stress parent involvement and family services, is this test met unless communication between parents and staff is frequent and informative, parents actually make use of services offered by centers, and are actually involved in center operations and decisionmaking. For the most part, it is this approach that parents use informally in deciding whether to place their child in a center, that directors use in evaluating classrooms, caregivers and programs for parents, and that visitors – whether licensing staff, congressmen or even researchers – use to decide whether a center is "good." In each case they go into the center, look and listen, and form intuitive judgments about whether the environment is a healthy one for children and whether the center is supportive of parents.

A final approach is based on demonstrable *outcomes.* For those who take this approach, quality finally resides in the center's impact on children and families. The "good" center is one that enhances children's self-respect, develops their language and communication skills, teaches them to get along with others, or teaches them cultural or religious values. Or, for those who adopt as goals stimulation of parent involvement and provision of services to parents, the "good" center is one whose services actually improve the welfare of families, and whose parent involvement program results in improved center functioning and an enhanced sense of efficacy on the part of parents. Measurement of outcomes requires assessment of change over time in the child and/or family through repeated developmental testing, clinical observation or parental report.

In view of the divergent and strongly held opinions on the definition and assessment of quality in child care, it is necessary to state clearly and forcefully the particular assumptions and values underlying the approach of the NDCS to the measurement of quality. Three premises are at the heart of the study's approach.

First, the welfare of the individual child and of children collectively must be central to any discussion of quality. From the standpoint of federal policy in purchasing care, the key issue is how to spend federal dollars so as to provide the maximum number of children with the best possible day care experiences. Other policy goals, such as freeing parents to work or providing employment in day care for low-income persons, are important in themselves but must be secondary considerations in setting purchasing standards for child care.

Second, it is not enough to protect children from obvious forms of harm such as malnutrition, accidents and communicable diseases. While this kind of protection is a necessary condition for quality care, it is not sufficient. Quality programs must, by definition, *actively promote healthy and normal social, emotional and cognitive development.* This does not mean that good day care centers must look like little schools. Formal education, narrowly conceived, is not the only way to promote development. Preschool children develop in a variety of ways through a wide variety of experiences, and there is ample room for parents and providers to emphasize particular aspects of development and particular kinds of experience while providing care consistent with a broad definition of quality. By the same token, health, nutritional and other "supplemental" services cannot be viewed as frills. These services are essential to normal development and, if not available through other channels, can and should be provided through day care.

Third, judgments of quality must rest on direct assessment of the child's daily experience and its developmental impact. Such judgments cannot be based on gross characteristics of centers such as numbers of staff and children, background qualifications of staff, or features of the physical environment. Indeed, the whole purpose of the NDCS effects analyses was to determine whether such center characteristics have the kinds of impacts on day care processes and outcomes assumed by current federal purchasing standards, the FIDCR, and some state and local licensing requirements.

PERSPECTIVES ON MEASURING QUALITY IN DAY CARE

It is all very well to state in the abstract that the child's experience and development together constitute the standard of quality; it is quite another matter to find a yardstick by which the measure of particular centers can be taken. In large-scale studies, the effects of early childhood programs have typically been evaluated through use of standardized developmental tests. The NDCS incorporated several such tests in its Phase III instrument battery, described below. However, existing tests suitable for use with preschoolers under field conditions are concentrated in a relatively narrow domain of cognitive and linguistic skills and simply do not measure in any direct or thorough way all of the developmental outcomes important to parents and providers – for example, enhancement of the child's self-esteem or ability to cope in group situations.

To be sure, there are many tests designed to measure social skills and other aspects of socioemotional development in preschool children.[1] However, most of these instruments have been used primarily in small-scale studies, conducted by highly trained investigators in academic settings. Even when used in such rarefied contexts, the tests have not, on the whole, shown reliabilities and validities that inspire much confidence. Despite these well-known difficulties, SRI conducted an extensive literature review and field test during Phase I in an effort to identify socioemotional measures suitable for NDCS purposes. Several of these were used in the Phase II natural study. Unfortunately, Phase II analyses indicated that the measures were not sufficiently reliable under the real-world field conditions of the NDCS to be retained for Phase III.

Recognizing from the outset the limitations of available standardized tests, ACYF asked Abt Associates and SRI to devote substantial resources to observation of children and caregivers in natural settings. In effect, the study's researchers adopted the perspectives of the parent and provider – basing judgments of quality in large part on direct assessment of the child's day-to-day experience.

SRI selected two observation systems – one focused on children and one on caregivers – which record daily behavior in considerable detail. Drawing on this rich and complex picture of the classroom, Abt Associates selected and constructed variables (listed below) that seemed likely – on grounds of common sense or of developmental theory and research – to reflect the ultimate impact of the day care center on the child. For each classroom or center, concrete questions like the following were asked: Is this a place where children show interest and participation in ongoing activities, or one where many children are isolated or withdrawn? Is this a place where caregivers engage in warm and stimulating interaction with children – responding, praising, comforting, questioning and so forth – or one in which caregivers spend much of their time in passive observation?

Judgments of quality were based on the entire pattern of caregiver behavior, child behavior and test scores that emerged from this analysis, rather than on preconceived notions of the values of particular behaviors in classroom interaction or the frequency of their occurrence. For example, it was not decided in advance that the praising of children by caregivers is an unqualified good, and that more praise invariably makes for a better classroom. Rather, it was discovered empirically that praising was part of a cluster of caregiver behaviors that tended to occur together (comforting, responding, instructing, and questioning were among the others) and that also were associated with active participation and high test score gains on the part of children. A positive value was placed on this whole complex of caregiver behaviors, child behaviors and child test scores.

Policy conclusions were derived through examination of patterns of caregiver-child interaction and developmental outcomes associated with various regulatory levers available to the federal government – staff/child ratio, group size, staff qualifications and other regulatable center characteristics. For example, conclusions regarding group size are based on the fact that the positively valued pattern of caregiver behavior, child behavior and test scores described above occurred in small groups more often than in large ones. These conclusions do not depend on the magnitude of one effect or a few effects; rather, they rest on a broad pattern of effects of varying strength, which are believed to have substantial collective developmental significance.

Perhaps the most important finding of the NDCS is that the many different dependent measures converge. It is possible to find classrooms that seem to be better or worse for children on a variety of dimensions and, moreover, to link these variations in quality to regulatable center characteristics. Others are free to disagree with the value judgments reflected in these interpretations and with the policy recommendations to which they give rise – but such disagreement must focus on broad patterns of outcomes, and not on isolated behaviors or test scores alone.

VARIABLES AND INSTRUMENTS

As indicated in the foregoing discussion of issues in defining and measuring quality in child care, the NDCS relied mainly on three types of instruments – an observation system focused on caregiver behavior, an observation system focused on child behavior, and several standardized tests. Initial selection of these instruments and of dependent variables to be derived from them was the responsibility of SRI. During Phase I, SRI reviewed relevant literature and consulted with experts in day care and child development in order to select appropriate dependent variables and to identify candidate instruments to measure them. Only outcome variables that were plausibly linked to the major policy variables were chosen. Dependent variables were also evaluated for their relevance to the diverse interests of the day care community, their measurability and their importance in developmental psychology research and theory. Instruments were screened against criteria of reliability, validity, practicality of use under NDCS field conditions and ability to measure variables appropriate to the goals of the study. The most promising instruments were field tested, and final selections made; the selection and field testing processes are described in a 1976 report by SRI.[2] Each of the three types of instruments, together with the principal variables derived from it, is discussed below.

Adult Observation Variables and Instruments

The system selected for observing caregivers and the classroom environment – the SRI Preschool Observation Instrument, or Adult-Focus Instrument (AFI) – had been used previously by SRI in evaluating the Follow Through and Head Start Planned Variation projects. The system was modified for the NDCS to record adult behavior in day care centers.

The AFI consists of a Physical Environment Inventory, which describes space, materials and equipment in the classroom; a Classroom Snapshot, which describes general activity patterns at a point in time; and a Five-Minute Interaction record, which describes the behavior of a particular caregiver in detail. The Five-Minute Interaction data are of primary interest here.

The instrument categorizes caregiver behavior in terms of codes that are fairly self-explanatory (e.g., COMMANDS, CORRECTS, INSTRUCTS). In NDCS analyses some of these codes have been grouped into broader categories. The following codes and groups of codes are discussed in the review of findings in Chapter Six:

- MANAGEMENT of children (commanding and correcting);
- SOCIAL INTERACTION (questioning, responding, instructing, praising and comforting);
- OBSERVATION of children; and
- CENTER-RELATED ACTIVITIES (planning, arranging materials, cleanup, recordkeeping, etc.).

The instrument also records whether the observed caregiver's behavior is directed to:

- a single child;
- a small group (defined as 2-7 children);
- a medium group (defined as 8-12 children);
- a large group (13 or more children); or
- other adults.

These codes, which indicate the distribution of the caregiver's attention, are also discussed in the review of findings.

Reliabilities, or **generalizabilities**, of the various adult-focus behavior codes and of the broader categories into which they were grouped were calculated using techniques developed by Cronbach and his colleagues.[3] Individual codes generally had reliabilities in the .4-.7 range; broader categories had reliabilities well above .8. Thus the variables derived from the Adult-Focus Instrument gave promise of being fairly sensitive measures of caregiver behavior. If the behaviors captured by the instrument were affected by regulatable center characteristics such as group composition or caregiver qualifications, such relationships would probably be detected (although the less than perfect reliabilities of some codes would lead to some underestimation of the true strength of relationships).

One of the most important features of the observation procedure was introduced in spring 1977 for both the adult observation instrument and the child observation instrument described below: each caregiver and each child was observed by two individuals, one black and one white. Phase II data had indicated the possibility that the observer's race influenced the frequency of use of certain codes in both instruments. The existence of such race-of-observer effects could not be ascertained with certainty because the Phase II design, in which observers, caregivers and children were usually matched in race, made it difficult to separate effects due to the observer's race from those due to the race of the caregiver or child.

At the urging of the study's black consultants, however, black and white observers were paired to guard against the possible compromise of policy conclusions by such effects.* Because behavior profiles for each classroom and center represented roughly equal numbers of observations by blacks and whites, these profiles were uncontaminated by race-of-observer effects. (Pairing of observers in fact conveyed other technical advantages and made it possible to estimate the reliabilities reported above.)

Child Observation Variables and Instruments

The system selected for observing children in the classroom environment – the Child-Focus Instrument (CFI) – was an adaptation of a system used in a study of day care by Elizabeth Prescott and her colleagues.[5] The instrument provided a fairly fine-grained description of child behavior in the day care setting. Observers coded child behavior in three areas: the degree to which the child was involved in group activities and the nature of those activities; the degree to which the child initiated interchange with other children and how she/he did so; the degree to which the child received input from others, the nature of such input and the child's reaction to it. Observers also coded the objects of the child's attention (environment, another child, group of children, or adult) and the duration of the child's activities.

The CFI specifies a total of fifty-four behavior codes to encapsulate this information. Extensive analysis of these codes, however, led to use of a smaller set of categories to summarize some of the most important aspects of child behavior, including:

- VERBAL INITIATIVE: giving opinions, preferences, information or comments;
- REFLECTION/INNOVATION: considering, contemplating, tinkering or adding a new toy or new idea to an ongoing activity;
- COOPERATION/COMPLIANCE: active, appropriate responding to requests and other initiatives from adults and other children;

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* This important contribution to the study's methodology is discussed more fully in the *Commentary* following Chapter Eight and in Volumes IV-A and IV-C of the NDCS Final Report.[4]

- GENERAL INTEREST/PARTICIPATION in center activities;
- AIMLESS WANDERING;
- NONINVOLVEMENT in tasks or activities;
- TASK PERSISTENCE: duration of longest activity;
- ATTENTION TO ADULTS;
- ATTENTION TO OTHER CHILDREN; and
- ATTENTION TO THE ENVIRONMENT (coded when a child was not interacting with people).

Some variables in this smaller set of child behaviors listed above are simply individual codes taken directly from the CFI (e.g., aimless wandering). Others were computed by combining separate codes into broader categories. Cooperation/compliance with requests from adults, for example, was computed by dividing the frequency of all active, appropriate responses to initiatives from others into the frequency of all responses (including not only active, appropriate responses but passive or inappropriate responses as well).

In addition to the variables listed above, a small set of codes which occurred infrequently but which represented behaviors of potentially great psychological importance were analyzed separately (using specialized statistical techniques necessitated by their rarity). The most important of these rare but important codes; those indicating the presence of hostility or conflict in the day care environment (hostile exchanges, hostile intrusions, threats, refusals to comply), are also discussed among the effects findings in Chapter Six.

Early in the study, child observation variables were conceived of as traits of individual children. However, examination of Phase II data, together with further review of the literature on natural observations of children, led to a reconceptualization of these variables. It became apparent that observations of children revealed more about the dynamics of the class than about the individual child. There was very little consistency over time in the amount of any particular behavior shown by a particular child. However, when frequencies of behavior were averaged across children to the level of the class as a whole, a moderate consistency emerged. For example, while particular children could not be identified as showing especially high or low levels of verbal initiative, it was possible to single out classes in which children as a group showed high or low levels of verbal initiative. Thus, attention was ultimately focused on relationships between regulatable center characteristics and classroom dynamics as revealed in the behavior of children – not on the impact of regulatable characteristics on traits of individual children.

Even at the level of the classroom, however, reliabilities of the child observation variables were considerably lower than those of the adult observation variables. Reliabilities ranged from .1 to .7 and were typically about .4. These relatively low reliabilities implied that the child observations could not be expected to show the sensitivity to regulated characteristics of classrooms that might be expected of the adult observations. Relationships would be harder to detect, and their magnitudes would tend to be seriously underestimated. On the other hand, if, in the face of limitations imposed by the instrument, relationships *were* found, they would be very significant, regardless of the apparent magnitudes of those effects.

It would have been desirable to supplement observations of children with standardized measures of individual social and emotional growth, given that the observations proved to reflect classroom process more than individual traits. However, unlike measures of classroom dynamics, trait measures would have been useful only if they were sensitive enough to show *change* as a function of the day care environment. Classroom dynamics are useful indicators of the quality of the child's experience, whether or not they change over time. In contrast, traits of individual children are not in themselves indicators of quality. Traits tell us something about the impact of day care, and hence about its quality, only if they change systematically when children are exposed to particular day care environments. (See the discussion of standarized tests in the domain of cognition and language, below.) To support change score analysis, tests must be extremely reliable; available socioemotional measures did not show the necessary reliability, either in published literature or under NDCS field conditions.*

Standardized Tests

In addition to observations, two standardized tests – the Preschool Inventory (PSI) and revised Peabody Picture Vocabulary Test (PPVT) – were used to measure the impact of center characteristics on aspects of school readiness in the study's three- and four-year-old children. The PSI is designed to measure a range of knowledge including shapes, sizes, parts of the body and spatial relationships (e.g., the child's understanding of prepositions such as "under," "over" and "in"). The PPVT is intended as a measure of receptive vocabulary, in which the child must match words and pictures.

The NDCS did not use these test scores directly as measures of the impact of day care, since absolute scores reflect children's family backgrounds and other factors outside the center's control. Instead, study staff examined the relationship between center characteristics and *changes* in PSI and PPVT scores from fall to spring, using statistical techniques designed to take account of both background factors and well-known technical problems with ordinary change score analysis.* The two tests had individual reliabilities of approximately .9, and change scores based on the tests had reliabilities of approximately .6. (For mathematical reasons, reliabilities of change scores are always lower than reliabilities of the individual tests on which they are based.)

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* Discussions of measures that were tried and discarded appear in SRI's first year report[6] and in the NDCS Second Annual Report[7] and Phase II Research Report.[8]

As suggested earlier, standardized tests represent the most conventional and most controversial of the dependent measures selected by the NDCS. The tests are conventional in that standardized measures purporting to assess cognitive skills have been part of almost every large-scale evaluation of programs for young children. They are controversial for two major reasons: First, minority scholars, including some consultants to the NDCS, have criticized the culturally biased nature of the skills such tests measure, have raised questions as to their value as measures of cognitive skill in black children, and have voiced concerns about their possible use to the detriment of black children, regardless of the intentions of the study's designers.** Second, child advocates and day care providers have questioned their relevance to the goals of most day care centers, which, according to these critics, stress for the most part social and emotional development rather than academic skills.

While recognizing the legitimacy of these concerns, the designers of the NDCS decided to incorporate these standardized tests among the study's dependent measures for reasons which seem even more compelling than the objections. First, while few parents or providers see day care *exclusively* as an environment for preschool academic preparation, the overwhelming majority see academic preparation as an important *part* of day care's contribution to the child. Fully 80 percent of NDCS center directors mentioned cognitive development as a major center goal in interviews on center philosophy, described in the previous chapter. In fact, *three-fourths of a sample of over 1100 parents interviewed during Phase II said that they had selected center care over other child care arrangements because in their judgment it offered better preparation for school.* Thus, inclusion of some traditional measure(s) of school readiness was essential if the NDCS was to address a broad area of parental and provider concern. Use of standardized tests in isolation would have been a serious error, but their use in tandem with observational measures of caregiver and child behavior seemed to represent a workable compromise among the many goals of child care providers and consumers.

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* These techniques are summarized in Volume II[9] and are described in detail in Volume IV-C of the NDCS Final Report.[10]

** See the *Commentary* that follows Chapter Eight.

106

Second, while the cultural bias of both tests is undeniable – children from disadvantaged backgrounds score lower than do middle-class children – this fact does not necessarily invalidate the tests as partial measures of school readiness for disadvantaged children. These children must eventually function in a school system where the skills possessed by their middle-class peers are highly valued. The tests may be valid predictors of *academic success* even though they are not valid measures of general *cognitive ability* in children from minority groups or poor families. In fact, there is evidence that PSI scores, at least, do predict later school achievement for disadvantaged children.[11] Although no current evidence indicates whether *changes* in PSI scores induced by day care or other preschool experience predict significant changes in later educational achievement, the possible existence of such a relationship is too important to ignore.

Other Dependent Variables and Instruments

Several additional instruments were used in the NDCS in the realm of dependent variables: the Child Development Associate (CDA) Checklist, the Day Care Forces Inventory (DCFI), the Phase II Parent Survey and the Phase III Parent Interview. All four instruments played only supporting roles in the study; none was used in analyzing the effects of regulatable center characteristics.

The CDA Checklist and the DCFI were added to the instrument battery in Phase III to provide additional information on caregiver attitudes and behavior, as well as on relationships between caregiver performance and child outcomes. The CDA Checklist is a 235-item observation instrument developed by SRI to record caregiver behavior related to the 13 competence categories specified in the CDA certification system.* The checklist was completed by SRI observers after each day of AFI observations. Analyses were designed by Abt Associates staff to determine whether the 235 concrete behavior items in fact clustered into groups corresponding to the 13 CDA competence categories; and how these behaviors related to those recorded using the AFI and CFI, as well as to children's test score gains. Results showed that behaviors conceptually related to each category were statistically correlated with each other, but that a more economical summary of the data used only five categories: First, a single global COMPETENCE score, comprising in turn four subcategories: a score for RESOURCES provided in the classroom (toys, equipment, space for various activities such as reading and listening); a score rating the ENVIRONMENT for safety and health; a score for the caregiver's skill at CLASSROOM MANAGEMENT; and finally, a score for CHILD ORIENTATION, indicating the degree to which the caregiver played an active role with children, stimulating their cognitive and social development. Scores for the global COMPETENCE construct, CLASSROOM MANAGEMENT and CHILD ORIENTATION proved to be related to children's test score gains, as shown in Chapter Six.[12]

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* The CDA Credential is a certificate in child care, awarded on the basis of demonstrated on-the-job competence. Competence is assessed by local teams on an individual basis; no checklist such as that developed for the NDCS is used. However, the CDA system does specify 13 "functional areas" of competence, and narrative evaluations generally comment on a caregiver's abilities in each of these areas. Actual narrative comments were used by SRI in developing the NDCS behavioral checklist. To date, the CDA Credential is recognized in the licensing requirements of 13 states and has been awarded to more than 3700 individuals.

The DCFI is an instrument designed to elicit caregivers' judgments about the importance and valence (positive or negative character) of factors in the day care environment which affect their work – space, equipment, the center director, other caregivers and various additional factors. The instrument uses a sorting technique, in which caregivers place in order a set of cards listing features of the environment, first according to importance and then according to valence. The DCFI was administered in Phase III to the 220 teachers and aides observed with the AFI and also to the 57 directors of target centers. The DCFI provided descriptive information on caregiver attitudes, but a variety of technical difficulties prevented use of the DCFI to determine whether caregiver attitudes were related to the policy variables.*

Parent measures were administered to samples of parents in both Phases II and III. In Phase II, a survey of 1165 parents of children in the study sample was conducted. The survey obtained information on background characteristics of families, parental attitudes on childrearing practices, parental expectations for and satisfaction with day care services, and their degree of involvement in center activities.**

In Phase III, in-depth interviews were conducted with 112 parents distributed across 12 publicly supported study centers (four in each site).§ Parents selected for participation represented those families most affected by federal day care policy – lower income, urban, minority, single-parent families. Information was collected on parental preferences for different types of day care, parent goals for children in day care, parent involvement in day care and family use of center services.[16]

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* See Volume IV-B of the NDCS Final Report.[13]

** Results were reported in the NDCS Second Annual Report[14] and the Phase II Research Report.[15]

§ An additional parent survey was conducted with several hundred parents in Phase III, to gather information on certain family behavior patterns and childrearing practices. Data were used in a subsidiary analysis of the impact of family behavior on test scores, described in Chapter Six.

Although measures of parental attitudes were not used in effects analyses, they provide important information for the policymaker about parental opinions on day care services supported by government funds. Parents are the closest and most constant observers of the day care center (apart from staff) and are the people most concerned about the impact of particular care arrangements on children. Moreover, their judgments give some indication of the public acceptability of different regulations.

Parents' views from Phase III about the importance of the different policy variables thus provide an important supplement to NDCS effects findings. When asked to choose between two different staff/child ratios – one teacher with four to six children and one with ten to twelve children – most parents preferred the high-ratio grouping because they felt that it offered more opportunity for attention to individuals and for a closer relationship between teacher and children. However, it was apparent from parents' responses that they were not considering the classroom ratio in isolation, but rather its interaction with another independent variable, teacher experience. An inexperienced teacher, they stressed, is unable to handle the larger number of children without sacrificing important aspects of care. Their choice of the higher-ratio grouping was a safeguard against inexperienced teachers.

This reasoning became even clearer when parents were asked to choose between a group with their preferred ratio (1:5) supervised by an inexperienced teacher, and a lower-ratio grouping (1:11) with an experienced teacher. Most chose the low-ratio grouping because they felt that a teacher who has had substantial day care experience is able to organize a larger group of children so that the quality of care is the same as or better than that provided by an inexperienced teacher with a small number of children. Parents were less impressed with the benefits of formal education and were unwilling to exchange a teacher with day care experience for one with a college degree. It should be stressed that these parents understood "education" to mean formal classroom courses in, for example, child development; many parents' comments in the interviews suggested that the kind of practical classroom apprenticeship that is a part of many specialized training programs would count as "experience" in their eyes.

Offered a choice of two different group sizes with the same ratio (a group of ten children with a single caregiver versus a group of 20 children with two caregivers), a majority preferred the smaller group, emphasizing the possibility that individual children would be "lost" in a larger group and that noise and confusion would increase.

The center's philosophy and the program that carries out that philosophy were parents' most important considerations in choosing a center.* Most parents saw center day care as an experience that prepares their child cognitively and socially for school. In addition, many expressed a desire to be more involved in classroom activities, although, as working parents, they were realistic about their limited availability as volunteers.

Health and dental services provided at the center were the services most visible to and most frequently used by parents. For working parents, the availability of medical and dental screening for children at their day care center is very desirable. Other services, such as job counseling or legal aid, were less often emphasized, primarily because parents felt that they were readily available outside of day care. Their responses made it clear that their communities make available a variety of resources ranging from legal aid services to assistance with emergency food and clothing.

In sum, parents stressed center philosophy, staff experience and availability of dental and health care as the center characteristics that most contribute to the desirability of a particular day care center. Small groups and high staff/child ratios were also seen as desirable, although parents generally felt that experienced staff could handle larger groups and lower ratios successfully. As will be seen in Chapter Six, NDCS findings on the developmental effects of different day care arrangements are in accord with parents' views in some respects, contradictory in a few respects and complementary (neither supportive nor contradictory) in still other respects.

SUMMARY: NDCS EFFECTS MEASURES AND QUALITY IN CHILD CARE

NDCS effects analyses focused on the quality of the child's experience in day care as indicated by converging patterns of caregiver and child behaviors and children's gains on standardized cognitive tests. Although these measures encompass much that is meant by quality in child care, they are not exhaustive. For example, for reasons discussed in earlier chapters, no attempt has been made to assess the impact of health and nutrition services on children's physical growth. Similarly, only preliminary attempts were made to gauge the effects of providing opportunities for parent involvement and/or supplemental services to families. However, the overriding reason for the study's emphasis on the social environment of the classroom and the psychological development of children was the expectation that the center characteristics mandated by ACYF for investigation from the outset – group composition and caregiver qualifications – would have their most important effects in these domains.* The following chapter is devoted to NDCS findings concerning classroom processes and child outcomes.

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* Because almost all of these parents received federally funded care, cost of care was not, for them, the important consideration that it has appeared to be for parents in other studies.

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* These variables may have effects in other domains as well. For example, one motivation for regulating staff/child ratio is to insure children's physical safety, both through prevention of serious accidents and through adult supervision and aid in emergencies such as fires. Such effects of the policy variables were examined insofar as possible. However, no serious emergencies were observed in the course of the study. Minor accidents were distributed randomly across centers, with no measurable relationship to group composition or caregiver qualifications.

CHAPTER SIX: LINKS BETWEEN POLICY VARIABLES AND MEASURES OF QUALITY

OVERVIEW OF FINDINGS

NDCS findings show that certain regulatable center characteristics are consistently associated with measures of day care quality. Composition of the day care classroom – the number of caregivers and the number of children grouped together – is linked to day-to-day behavior of children and caregivers and to children's gains on the Preschool Inventory (PSI) and the revised Peabody Picture Vocabulary Test (PPVT). Smaller groups of children and caregivers and, to a lesser extent, higher staff/child ratios are associated with more desirable classroom behavior; smaller groups are also associated with higher test score gains. Moreover, aspects of caregiver qualifications, especially education/training relevant to young children, are associated with positive classroom dynamics and superior test score gains. Specific findings are as follows.

- In *smaller groups*, as contrasted to larger ones,
  - lead teachers engage in more social interaction with children and less observation of children;
  - children show more cooperation, verbal initiative and reflective/innovative behavior;
  - children show less hostility and conflict and are less frequently observed to wander aimlessly or to be uninvolved in tasks or activities; and
  - children make greater gains on the PSI and PPVT.
- In *higher-ratio classes*, as opposed to those with lower staff/child ratios,
  - lead teachers devote less time to managing children (commanding and correcting) but more time to center-related activities and to interaction with other adults.
- In classes supervised by *lead teachers with child-related education/training*,
  - lead teachers spend more time in social interaction with children; and
  - children show more cooperation and greater task persistence and are less frequently uninvolved in tasks or activities.

- In centers where the *proportion of caregivers having child-related education/training is higher,*
  - children make greater gains on the PSI.

What do these findings imply for the quality of the child's experience in day care? Small groups, especially those supervised by **lead caregivers** with preparation relevant to young children, are marked by activity and harmony. Caregivers are warm and stimulating. Children are actively engaged in learning and get along well with others. Presumably as a consequence of this type of day care experience, children also make rapid strides in acquiring the skills and knowledge tapped by standardized tests. Larger groups, especially those supervised by caregivers without education or training specifically oriented toward young children, present a contrasting picture. Caregivers fall into a passive posture, monitoring activities of many children at once, without active intervention. In such an environment, some children "get lost." Apathy and conflict are somewhat more frequent than in small groups. And, again presumably as a result of these classroom dynamics, gains on standardized tests are slower than they might otherwise be in day care settings.

Small groups are associated with positive classroom dynamics and higher test scores in all three of the study's diverse sites. Associations between group size and test scores are especially strong in centers serving children from low-income families. Associations between child-related education/training and test scores are also particularly strong in centers serving children from low-income families. However, the latter effects are more variable across sites than those of classroom composition and are especially strong in Atlanta, where a single well-defined training program has wide influence.

Other regulatable center characteristics, though not investigated as intensively as classroom composition and caregiver qualifications, also prove to be associated with measures of quality. The philosophy or curricular orientation of center staff is linked to children's test score gains: children make greater gains in centers where staff cite cognitive development as a center goal and where they focus on individual development rather than group experiences. In addition, children's behavior varies (in ways too complex to be easily summarized) with the amount of indoor and outdoor space available per child.

Taken as a whole, the results suggest that an identifiable set of center characteristics is associated with benefits for low-income children and families, who have been the primary focus of federal child care policy. These conclusions are amplified throughout the remainder of this chapter. Before turning to specific findings, however, it is essential that the reader be given a context for interpreting the results to be presented.

A CONTEXT FOR NDCS FINDINGS

All NDCS findings take the form of statistical relationships between variables, for example, between group size and the amount of cooperation shown by children. These relationships are represented below in several ways – in prose, numerical examples and graphic displays. This chapter is intended primarily to describe relationships, not to draw their implications for policy – policy interpretation is the task in Chapter Eight. However, in order to understand the significance of the data presented here and to appreciate the policy implications to be drawn later, it is important to grasp two fundamental issues: (1) the role of causal interpretation in drawing policy conclusions from statistical relationships; and (2) the degree to which substantive or policy significance rests on the strengths or magnitudes of relationships.

Association, Causality and Policy Interpretation

NDCS data permit study of classroom composition and caregiver qualifications by two different means. First, both the 49-center quasi-experiment and the Atlanta Public Schools (APS) study incorporated controlled manipulations of staff/child ratio – the element of classroom composition that has been the focus of greatest interest and controversy in the policy arena. The APS study also incorporated a controlled manipulation of caregiver education. These controlled manipulations potentially allowed the NDCS to discover *causal* connections between the manipulated center characteristics and test scores.

Second, in both components of Phase III there was a great deal of natural variation in regulatable characteristics across centers and classes within treatment and comparison groups in the two designs. Whether or not the experimental manipulations showed effects, behavioral *correlates* of variations in regulatable characteristics could still be examined, although airtight causal inferences could not be drawn from any associations that might be found. If an unmanipulated center characteristic, such as group size, proved to be associated with several quality measures (as in fact it did), that association might be due to a causal relationship between group size and quality, but it might also be due to unmeasured center characteristics that were associated with both group size and the particular quality measures in question. In the latter case group size would serve as an *indicator* of quality (though not a cause) by virtue of its association with the unmeasured causal variables.

For policy purposes, both causal and associational linkages are important. The NDCS was designed to help the federal government formulate effective purchasing standards for child care by identifying characteristics of day care centers that are associated with quality care and by identifying the costs of such center characteristics. If some center characteristic can be shown to cause good classroom dynamics or to enhance development of children, that characteristic is clearly a candidate for inclusion in federal purchasing standards, assuming that its costs do not outweigh its benefits. However, proof of a causal relationship between a given center characteristic and measures of quality is not necessary for that center characteristic to be included in purchasing standards. As long as a center characteristic reliably predicts quality care (i.e., is an indicator of quality), it makes sense for the federal government to purchase care in centers with that characteristic.

This point is important because virtually all NDCS findings and conclusions rest on associational data. Despite the substantial resources at the study's disposal, and despite the cooperativeness of participating centers, only two center characteristics (staff/child ratio and staff education) could be manipulated experimentally within the constraints of sample size. Experimental manipulation of staff/child ratio and staff education in the 49-center and APS studies had only scattered and largely nonsignificant effects. Thus, raising either staff/child ratio or level of staff education in isolation is not an effective way to increase quality in child care, at least within the limits of the policy-relevant ranges and durations of changes examined in the NDCS. In contrast, natural variations in group composition and child-related education/training are associated with distinctive patterns of caregiver behavior, child behavior and test scores. Group composition and certain caregiver qualifications are thus indicators of quality, although NDCS data do not permit firm conclusions as to their causal status.

Policy Significance and Magnitudes of Relationships

It is natural to suppose that policy conclusions should be based primarily on very strong statistical relationships and that weaker relationships constitute a less useful basis for policy decisions. However, strengths of association can be misleading, and weak relationships can be informative for policy, partly because technical factors conspire against statistically strong findings in large-scale studies such as the NDCS, and partly because statistical strength does not necessarily reflect substantive importance to children.

To see these points more clearly, it is helpful to ask what impact regulation might reasonably be expected to have on caregivers and children, and what kinds of results might reasonably be expected from any large-scale study of the effects of variations in child care programs. The word "variations" is critical here, because, as indicated earlier, the NDCS addresses the effects not of day care per se but of differences in day care programs, particularly the differential effects of center characteristics that are or can be controlled by state and federal regulation.

Previous national evaluations of outcomes associated with different levels of resource outlay in education or with program variations within early intervention projects give some indication of what to expect, although no previous study is precisely analogous to the NDCS in purpose, scope and method.* Such studies have typically shown that measured effects of variations in programs or resources are small. Often effects due to program differences cannot be detected at all. This may be true for any of several reasons. Outcome measures or research designs may lack the sensitivity to detect effects of variations in programs or resources. Program differences may be poorly defined, implemented or measured. Finally, differences in outcomes may be genuinely small relative to the effects of the program per se (e.g., of school itself, or of early intervention itself) or relative to the effects of other factors, such as the socioeconomic backgrounds of the children served.

Thus, earlier studies might lead one to expect that center characteristics controlled or controllable by regulation will play a somewhat limited role in determining the quality of care, defined in terms of daily interactions and developmental changes in children. Moreover, previous findings indicate that such effects may be difficult to measure even when they do exist.

The NDCS had to contend with some of the limits of instrumentation and design that confronted earlier studies. As shown in Chapters Four and Five, some measures were less reliable than would have been ideal, and some aspects of children's development could not be measured. For statistical reasons, limited reliability of measures leads to systematic underestimation of the true strengths of relationships, and can prevent genuine relationships from being detected. Moreover, because many center characteristics had to be studied as they occurred naturally, these characteristics were not fully independent of each other, creating some difficulty in disentangling their effects. The NDCS was in effect a search for signals in a noisy environment, as is often the case in large-scale policy studies.

On the other hand, the NDCS had advantages over previous studies. Its independent variables, particularly those relating to classroom composition (number of children and number of caregivers), were defined clearly and measured precisely. In addition, the study's dependent variables included observational measures of an unusually broad range of child and caregiver behaviors, as well as test scores. Therefore the opportunity to detect effects in this study was significantly greater than in studies that used narrow sets of outcome measures, or that focused on effects of programs that may have differed less in reality than in theory.*

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* See note 27, Chapter One.

In sum, the NDCS had advantages over previous studies but nevertheless faced important technical constraints. It was not at all certain that the study would be able to find systematic differences among classrooms or centers, or that such differences, if found, would be linked to any of the study's policy variables. *The fact that such links were found in the face of many technical obstacles can be interpreted as strong evidence that choices among different day care arrangements make a difference for children.* Not surprisingly, variations from child to child within centers are larger than differences between centers in average behavior patterns or average test score gains.[1] In other words, differences linked to individual children and their home environments outweigh those linked to centers. Nevertheless, variation associated with the center is significant, in both a statistical and practical sense. Moreover, a substantial proportion of the center-to-center variation is linked to center characteristics that are subject to regulation.

But *how* substantial are the links between policy variables and measures of quality? Unfortunately, there are no universally accepted criteria for answering this question. The question cannot be answered solely by reference to the statistical strengths of relationships that were found. The point has already been made that magnitudes of relationships are usually underestimated and are therefore misleading. More important, even small differences in the day care environment can be crucial for parents or providers, or for the child's long-term development. For example, a small increase in cooperative behavior might be highly valued by parents, or a small increase in task persistence might have important implications for the child's success in elementary school.

For all of these reasons, it can be argued that the magnitudes of the various relationships obtained are secondary. The most important aspects of the NDCS effects findings are the following: (1) the *existence* of statistically significant relationships between policy variables and day care quality, reflected in caregiver behavior, child behavior and test scores; (2) the *relative strengths* of different policy variables – the fact that some policy variables are clearly related to quality, while others are not; (3) the *directions* of relationships between policy variables and measures of quality; and (4) perhaps most important, the *consistency* of findings – the fact that three relatively independent sets of quality measures – caregiver behavior, child behavior and test scores – all point to the importance of the same policy variables – classroom composition (especially group size) and child-related education/training. The last point is further reinforced by the fact that different portions of the study's data base – data from both the Atlanta Public Schools and 49-center studies – likewise single out the same policy variables (although detailed patterns of effects differ somewhat between the two studies). These four aspects of the data are emphasized throughout the presentation of findings which follows.

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* Use of multiple dependent measures increases the probability of finding spurious, chance "effects" as well as the probability of finding genuine effects that might otherwise be overlooked. However, given that no NDCS policy conclusion rests on one or two isolated findings, the threat to these conclusions from chance effects is slight.

DATA SOURCES AND ANALYSES

Findings reported in the following sections are based on multivariate statistical analyses and have been subjected to extensive methodological scrutiny.* Potential statistical pitfalls have been examined and shown not to threaten reported conclusions. In particular, basic results hold when various alternative combinations of independent variables are used in analyses. They hold when different units of analysis – child, class or center – are used. They are not attributable to atypical cases, or to a few extreme cases (except in one instance to be noted later). Attrition, or change in the composition of the sample of children from fall to spring, does not account for the results obtained. Finally, in cases where particular center characteristics are reported to have no effects, there is little likelihood that such effects were merely overlooked or missed because of insensitivity of the measures or design. Reliabilities of independent and dependent measures have been shown to be adequate, given NDCS sample sizes, to detect any effects large enough to be of practical importance (though, as noted above, modest reliabilities of some measures undoubtedly led to underestimation of the strength of effects).

The results reported below represent only a fraction of all NDCS analyses.** Results selected for presentation met criteria of importance for policy, consistency of direction across different portions of the Phase III data and statistical significance in the major data set singled out for description here (see below). Potential relationships between center characteristics and measures of quality which are *not* discussed here are omitted either because no significant relationship was found or because findings were so scattered or inconsistent across Phase III data that no firm conclusions could be drawn.

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* Every relationship reported in the summary sections corresponds to a significant coefficient obtained in one or more multiple regression analyses, described in Volume II[1] and in detailed supporting papers in Volume IV-C.[2] Almost all of the results discussed below are based on regression coefficients significant at the .05 level or better (i.e., the results would be obtained by chance less than one time in 20). A few of the less central relationships reported below are significant at levels between .05 and .1 (i.e., they would be obtained less than one time in ten by chance.)

** See Volume II[3] for more complete analyses of effects findings.

The presentation of data on adult and child behavior in the classroom is based primarily on spring observations from the 49-center study. The 49-center data are emphasized because they give a fuller picture of centers nationally than do the more homogeneous and localized APS centers. (For the most part, APS results reinforced those of the 49-center quasi-experiment, particularly with respect to the relative importance of the different policy variables; major differences are discussed where relevant throughout the chapter and highlighted in the final section, which compares outcomes for different portions of the overall study sample.) Spring data on classroom behavior are stressed because they reflect interaction patterns that have stabilized over the day care year and because spring observation procedures incorporated several improvements over those used in Phase II and in the fall of Phase III, notably the pairing of black and white observers, reported in Chapter Five.

As indicated earlier, all discussion of PSI and PPVT scores in the following sections is based on gains from fall to spring in Phase III, adjusted to take account of analytic difficulties inherent in simple difference scores. Discussion of test scores is based primarily on data drawn from all 57 Phase III centers, pooled as a single group.*

EFFECTS OF CLASSROOM COMPOSITION

As noted earlier, positive outcomes are associated with groups composed of small numbers of both children and caregivers. (Recall from Chapters Three and Four that numbers of children and numbers of caregivers per group are closely linked, so that the two aspects of classroom composition behave in essentially identical fashion.) There is no single point of demarcation between small or "good" groups and large or "bad" ones; rather, there is a gradient along the entire range of group sizes: smaller groups are associated with more desirable caregiver and child behavior and greater gains on the PSI and PPVT. (Despite the lack of a point of demarcation, it is possible, as shown in Chapter Eight, to establish the range of group sizes that are acceptable for policy purposes, using data on quality in conjunction with data on costs and on practices prevailing in the day care world.)

Benefits of small groups are observed even when **caregiver/child ratios** are held constant within the policy-relevant range included in this study. For example, groups of 12-14 children with two caregivers have, on the average better outcomes than groups of 24-28 children with four caregivers, although staff/child ratios are identical in the two cases (1:6-1:7).[*]

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* Justification for pooling centers from the two experiments is presented in Volumes II^4 and IV-C^5 of the NDCS Final Report.

Effects of staff/child ratio with group size held constant are generally positive but not as large, as clearly beneficial, or as consistent across portions of the data, as those of group size. Effects of ratio, like those of group size, take the form of trends across the entire range studied. (Again, it is shown in Chapter Eight that a range of ratios acceptable for federal purchasing standards can be established by combining data on the links between ratio and quality with additional data on costs and current practices.)

Classroom Composition and Lead Teacher Behavior

Lead teachers in small groups spend substantially more time in various forms of social interaction with children (praising, responding, comforting, questioning and instructing) than do lead caregivers in large groups.[**] Lead teachers in small groups spend substantially less time observing children than do their counterparts in large groups. Observation of children is a necessary activity to which all caregivers devote a good deal of time, and skilled caregivers use what they have learned through observation to interact more effectively with children. However, as measured in the NDCS, large amounts of observation tend to reflect passive monitoring of children rather than active study of their behavior intended to increase the effectiveness of caregiver-child interaction. Thus, the dual pattern of high levels of social interaction and low levels of observation found in small groups indicates that lead caregivers in such groups tend to be more actively involved with children than those supervising large groups.

These relationships are illustrated in Figure 6.1. The structure of this figure will be explained in some detail, as subsequent figures will be of similar form. Group sizes are arrayed from small to large along the horizontal axes of both parts of the figure. Frequencies of behavior are arrayed along the vertical axes – in Figure 6.1A, the frequency of social interaction, and in Figure 6.1B, the frequency of observing. The thick straight line in Figure 6.1A shows the correspondence between group size and frequency of social interaction; the line represents the best statistical description of the relationship found in NDCS data.[*] Note that the line for social interaction slopes downward from left to right, indicating progressively less interaction as groups grow larger, while the line for observing (Figure 6.1B) slopes upward, indicating progressively more monitoring of children as groups grow larger.[**]

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[*] For each finding reported in the text below, effects of all policy variables, save the one of interest, have been statistically removed, so that effects of the variable in question can be isolated. For example, all of the relationships attributed to group size hold when staff/child ratio, staff qualifications and other center characteristics are controlled.

[**] Most of the results reported in this chapter focus on lead teachers rather than aides. As explained in Volume II of the NDCS Final Report,[6] lead teachers were observed in virtually all NDCS classrooms, whereas aides were observed in only a sample of classrooms. Results for aides do not parallel these for teachers, but rather show a division of labor in which aides take over some of the teacher's functions in large, high-ratio groups. However, the functions of aides are limited, so that children do not experience as much interaction with adults in such situations as they do in smaller groups. (See Figure 6.6 below and accompanying text.) Thus the results for aides do not diminish the importance of group size.

Group sizes of 24 and 12 correspond to the upper and lower limits of the region in which the middle 75 percent of NDCS centers lie. This region is shaded on the graph, and the line crossing this region illustrates the range of effects found across the bulk of the study's sample. (Note that these boundaries have no special policy significance and do *not* correspond to the policy ranges established in Chapter Eight.)

The difference in frequency of social interaction for groups of 12 and 24 is shown in the insert, expressed as a percentage difference. For example (Figure 6.1A), social interaction between caregivers and children was observed 170 times per hour in the typical 12-child group and 144 times in the typical 24-child group. Thus, social interaction occurred 26 times more in groups of 12 than in groups of 24, a difference of 18 percent (26 divided by 144, multiplied by 100). It must be remembered that the data tend to underestimate true strengths of relationships, for reasons cited earlier. Thus, lines representing "true" relationships would be more steeply sloped than those shown, and percentage differences in frequencies of behavior would be greater than those shown.

The thinner curving lines on each side of the straight line in Figure 6.1A are "confidence bands," indicating the degree of certainty attached to the placement of the line. Confidence bands are narrow (i.e., there is little margin of error in placement) in regions where the NDCS sample included enough centers for highly accurate estimation (shaded areas). Confidence bands grow wider at extreme values of group size, which are represented by relatively few centers in the sample.

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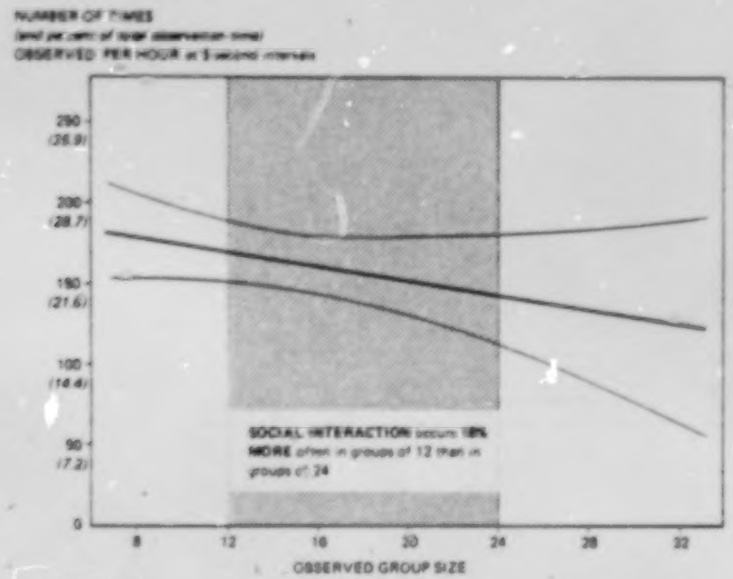
[*] The technical reader may wish to know that lines are ordinary least squares regressions of frequency of each behavior on group size. Regressions using single independent variables are shown throughout this chapter for ease in interpretation by the nontechnical reader. Regression lines are shown only for relationships which withstood multivariate testing.

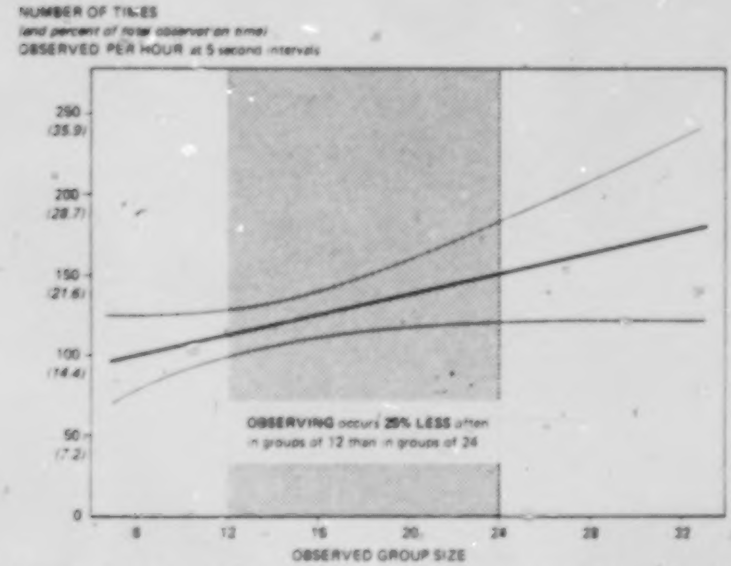
[**] The slope of each line gives a rough indication of the magnitude of the relationship shown. However, the slopes of lines depend on the scales to which the axes are drawn. Slopes can be compared only for lines drawn on similar scales. Also, the percentage differences shown on each graph (explained in the text) depend on both the slope of the line and its height; i.e., on differences in frequency of a given behavior between groups of 12 and 24 and on the overall average frequency of the behavior. Therefore large percentage differences will not always correspond to steep slopes, nor subtle differences to flatter slopes.

Figure 6.1: The Relationship between Lead Teacher Behavior and Group Size

A. SOCIAL INTERACTION



B. OBSERVING



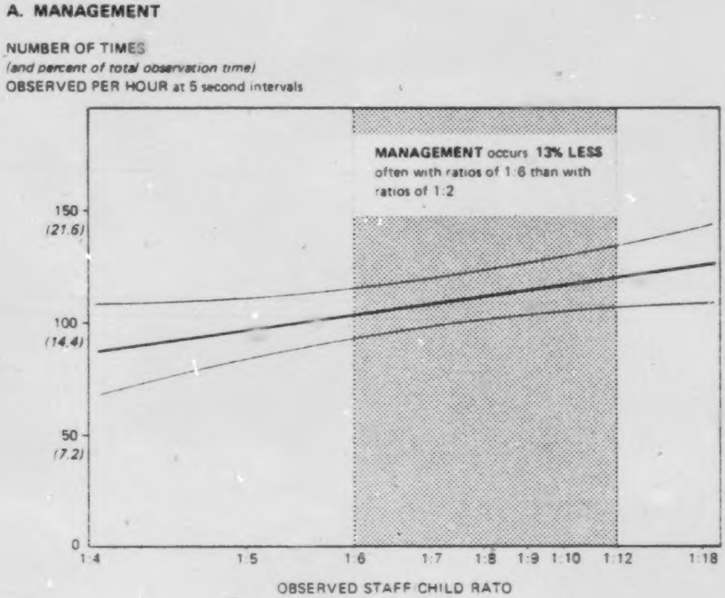
Shaded portions of figures, between group sizes of 12 and 24, correspond to the region in which the middle 75 percent of NDCS centers lie. Figure 6.1 and all subsequent figures are intended to illustrate the directions of relationships between the policy variables and quality measures, as well as the consistency of the pattern of results that emerged across different outcome measures. See the text, pages 000, for a discussion of the interpretation of the magnitudes of relationships shown.

Figure 6.2 illustrates the relationships between staff/child ratio and caregiver behavior. In classes with high staff/child ratios (few children per caregiver), lead teachers do less overt managing (commanding and correcting) of children than do their counterparts in low-ratio classes; that is, the line representing the best fit to NDCS data slopes upward from left to right in Figure 6.2A. Lead teachers in high-ratio classes spend proportionally more of their time performing center-related tasks (e.g., planning, organizing materials, doing paperwork) and interacting with other staff than do those in low-ratio classes, as shown in Figures 6.4B and C. Thus, extra caregivers appear to remove some of the burden of classroom management from the lead caregiver and also to divert some of the lead caregiver's efforts to dealing with other adults and doing chores.

Classroom Composition and Child Behavior

Children in small groups show higher frequencies of cooperation and compliance, and of reflection and innovation (considering, contemplating, contributing new ideas) than children in large groups. They also show a marginal tendency to engage in more verbal initiative (giving opinions, making spontaneous comments). Aimless wandering and lack of involvement in tasks or activities are less

Figure 6.2: The Relationship between Lead Teacher Behavior and Staff/Child Ratio

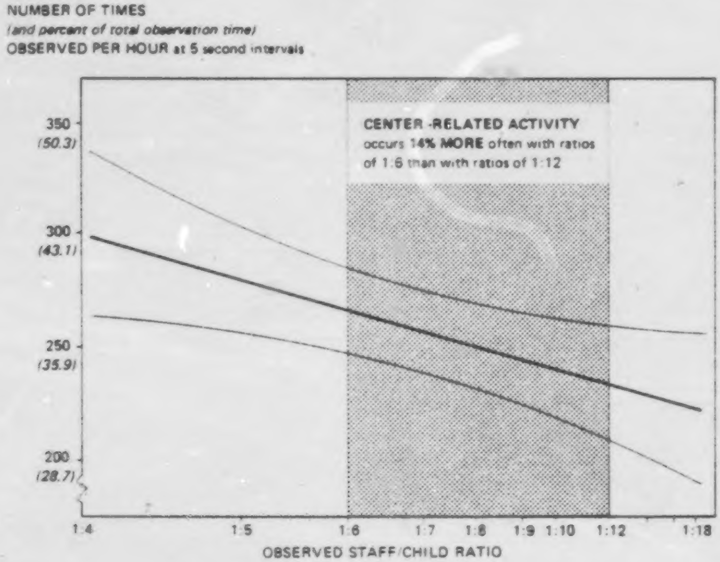


A. MANAGEMENT

MANAGEMENT occurs **13% LESS** often with ratios of 1:6 than with ratios of 1:2

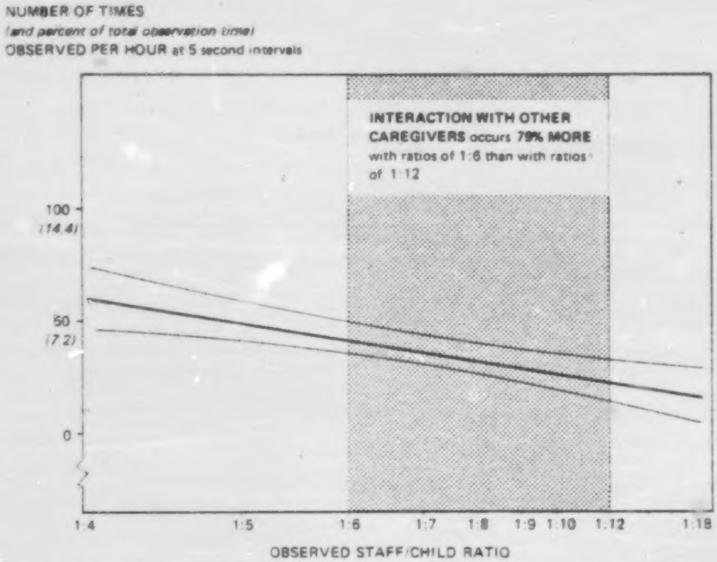
Figure 6.2: The Relationship between Lead Teacher Behavior and Staff/Child Ratio (continued)

B. CENTER-RELATED ACTIVITY



CENTER-RELATED ACTIVITY occurs **14% MORE** often with ratios of 1:6 than with ratios of 1:12

C. INTERACTION WITH OTHER CAREGIVERS



INTERACTION WITH OTHER CAREGIVERS occurs **79% MORE** with ratios of 1:6 than with ratios of 1:12

Shaded portions of the figures, between staff/child ratios of 1:6 and 1:12, correspond to the range of ratios linked (for policy purposes) to group sizes of 12 and 24. (See Chapter Eight for an explanation of the linkage.)

common among children in small groups than among children in large groups. Threats, squabbles and hostility, while rare in all NDCS child observations, are especially rare in small groups. In the fall data and in APS data for both fall and spring, children also show more general interest and participation in classroom activities than their counterparts in large groups.

These relationships between classroom composition and selected aspects of child behavior are illustrated in Figure 6.3. Panels A and B illustrate the progressive decline in frequency of reflection/innovation and cooperation across groups of increasing size. Panels C and D illustrate the progressive increase in frequency of noninvolvement and aimless wandering in groups of increasing size.

Links between staff/child ratio and child behavior are not as consistent across data sets as those between group size and child behavior. In the spring 49-center data, children in high-ratio classes show more interest and participation and more task persistence than their counterparts in low-ratio centers. However, because these relationships are not found in either the APS data or the fall 49-center data, they cannot be declared with confidence.

It is significant that high ratios are *not* associated with the overall frequency of child-adult interaction. The principal rationale for use of ratio as a regulatory tool has been that high ratios allow caregivers more time for each individual child. Earlier it was reported that lead teachers spend some of this additional time with other adults and in center-related activity. Apparently, enough of the caregiver's time is devoted to these activities to nullify the potential increase in adult-child interaction made possible by high ratios. It is also significant that total group size, unlike ratio, *is* associated with child-adult interaction. This important relationship is explored further in a later section.

Classroom Composition and Gains on the PSI and PPVT

As indicated earlier, NDCS analyses of test scores focused on children's fall-to-spring gains on the PSI and PPVT. The gain scores used in the analysis were not simple differences of spring and fall scores, but adjusted values calculated to avoid certain technical problems posed by simple difference scores. These adjusted gain scores were found to have two extremely important properties: they were almost completely independent of the child's age, sex, race, family income, mother's education and other socioeconomic background characteristics.* Moreover, they were relatively independent of the racial and socioeconomic composition of the center as a whole. These properties were important in that they made

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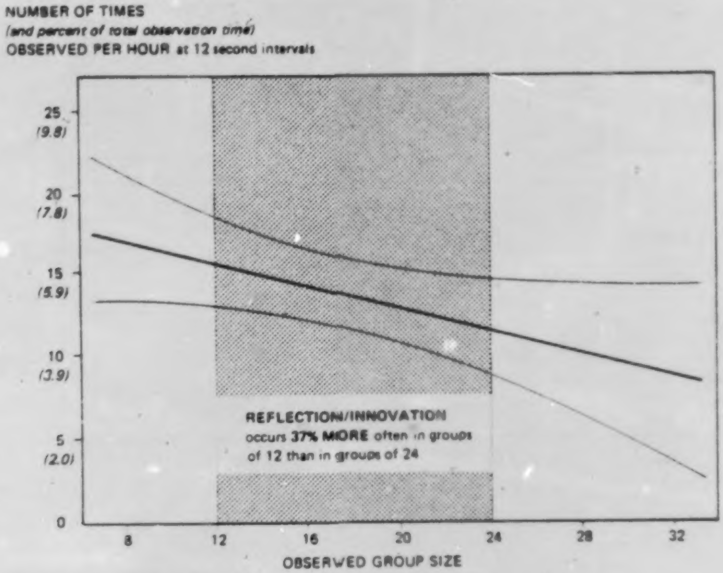
* As expected on the basis of results of other studies, there was a slight influence of race on PPVT gain scores. However, the effect was so small as to have virtually no effect on policy analyses. PPVT scores were nevertheless statistically adjusted prior to analysis to remove the minor difference associated with race.

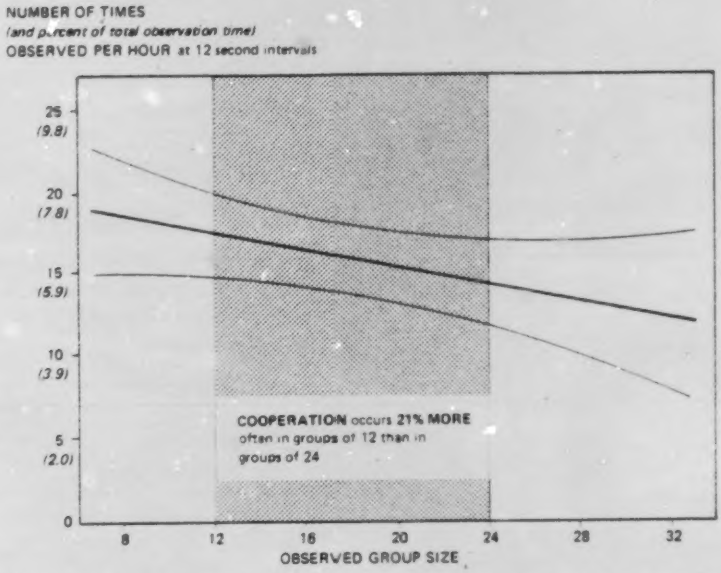
Figure 6.3: The Relationship between Child Behavior and Group Size

A. REFLECTION/INNOVATION



REFLECTION/INNOVATION occurs **37% MORE** often in groups of 12 than in groups of 24

B. COOPERATION [a]



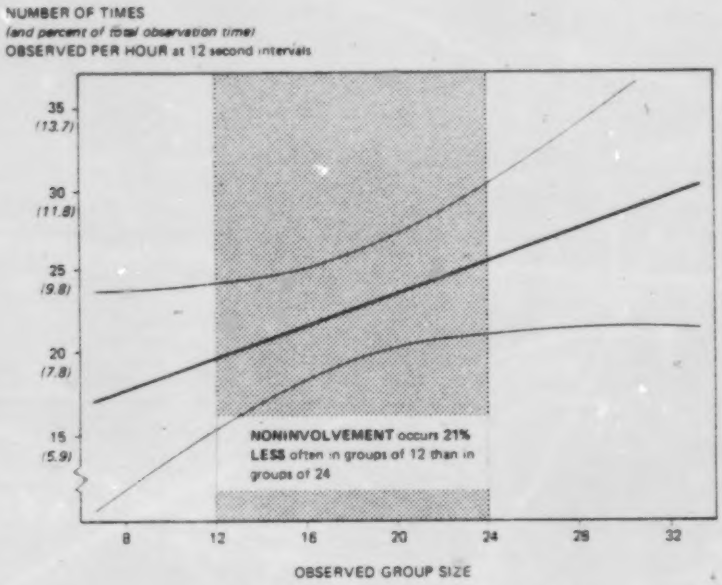
COOPERATION occurs **21% MORE** often in groups of 12 than in groups of 24

Shaded portions of figures, between group sizes of 12 and 24, correspond to the region in which the middle 75 percent of NDCS centers lie.

[a] For display purposes, COOPERATION, described in Chapter Five as the proportion of appropriate responses to adult initiatives, was re-computed to represent the proportion of the *child's* total time spent actively, appropriately responding to adult initiatives.

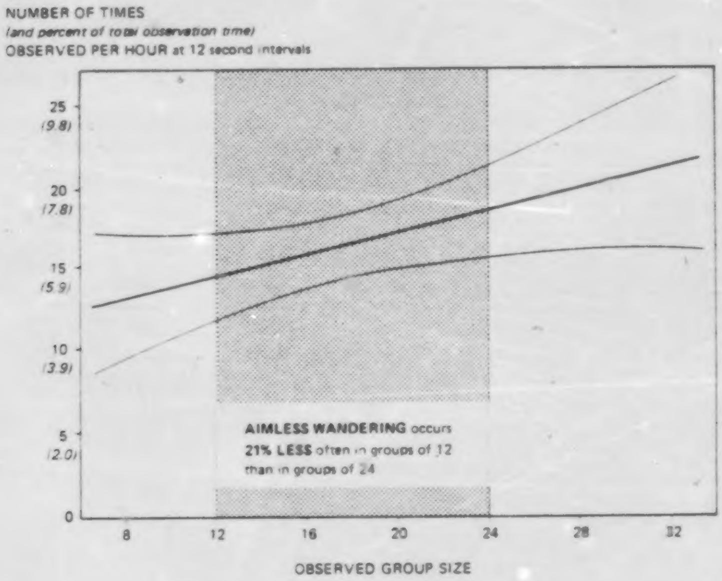
Figure 6.3: The Relationship between Child Behavior and Group Size (continued)

C. NONINVOLVEMENT



NONINVOLVEMENT occurs 21% **LESS** often in groups of 12 than in groups of 24

D. AIMLESS WANDERING



AIMLESS WANDERING occurs **21% LESS** often in groups of 12 than in groups of 24 further statistical adjustments to compensate for effects of socioeconomic and demographic background variables much less critical.

The absence of effects due to global background variables does not imply that adjusted gain scores were unaffected by children's home environments. On the contrary, variations in home environment *within* racial and socioeconomic groups had substantial effects on children's test score gains. The impact of family background was investigated for a sample of 110 children for whom PSI data were available for four time points (fall and spring of Phases II and III). A set of variables developed by Virginia Shipman of the Educational Testing Service, describing family behavior and childrearing practices, were powerful predictors of children's test score gains.[7] Three of Shipman's family descriptors ("family takes newspaper," "child has specific favorite story," "child spends time with father") were positively related to gains; one descriptor ("number of adults who watch television with child") was negatively related to gains. Together the four variables accounted for thirty percent of the variation in children's gains. (This proportion was reduced by conservative statistical procedures, but remained substantial in every analysis conducted.) Thus adjusted gain scores proved to be sensitive to environmental effects in this supporting longitudinal study. They also proved to be sensitive to variations within the *day care* environment in NDCS effects analyses.

The relationship between group size and test score gains is illustrated in Figure 6.4, which parallels Figure 6.1, except that centers rather than classrooms are the units of interest.* Figure 6.4 shows the progressive decline in test score gains that accompanies increasing group size.

Children's gains on the PSI were higher in centers that maintained smaller groups of children (and caregivers) than in centers with larger groups. For example, gains averaged approximately 7.0 points in groups of 12 children, compared to 5.9 points in groups of 24. The difference of 1.1 points represents a 19 percent advantage in growth rate in groups of 12 compared to groups of 24. Since children's gains averaged about 6.5 points over the 7-month period between fall and spring (about .9 points per month), the 1.1 point difference also translates into 1.2 months differential gain over the seven-month period, in groups of 12 compared to groups of 24. (Most children in the sample gained more rapidly than children

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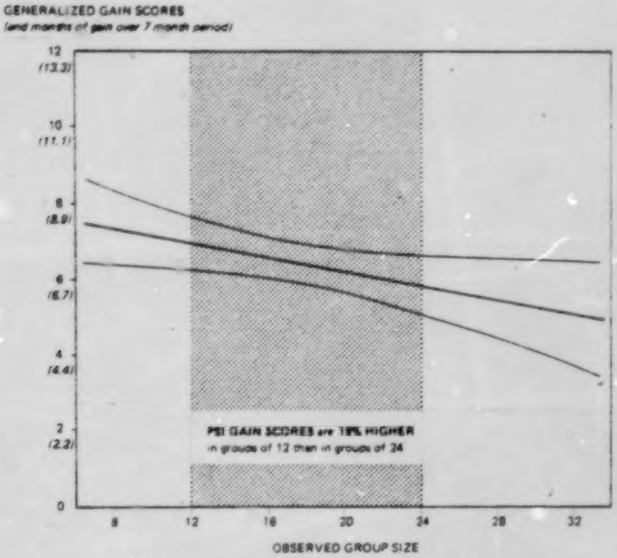
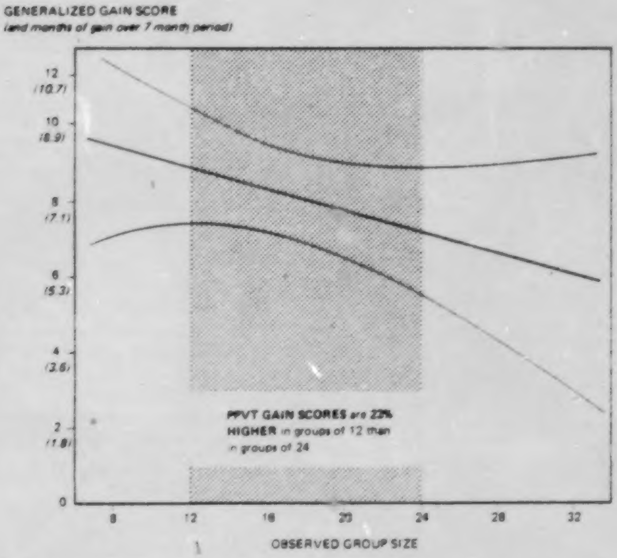
* Meaningful analyses of class-average changes on the PSI and PPVT could not be conducted, because children changed classes, and because classes frequently split or merged between fall and spring. Therefore analyses of test scores were conducted using both the individual child and the whole center as units of analyses. Policy analyses, however, were conducted at the center level because this level was more appropriate for policy purposes. Note that instability of class membership did not affect class-level analyses of behavioral data, reported above, since no *change* measures were involved.

Figure 6.4: The Relationship between Child Test Score Gains and Group Size

A. GAINS ON PRESCHOOL INVENTORY (PSI)



B. GAINS ON PEABODY PICTURE VOCABULARY TEST (PPVT)



Shaded portions of figures, between group sizes of 12 and 24, correspond to the region in which the middle 75 percent of NDCS centers lie.

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tested in previous national studies; the difference between small and large groups corresponds to almost two months' gain in these earlier studies.)

Gains on the PPVT were 1.7 points higher in groups of 12 children over a seven-month period than in groups of 24, a 23 percent acceleration in growth in small groups as opposed to large, corresponding to roughly 1.6 months differential gain in a seven-month period.

By contrast, high staff/child ratios by themselves were not associated with high gains on these tests in the 49-center quasi-experiment. No effect of ratio was observed across all 49 centers together, and none was observed when "treated" centers with ratios averaging 1:5.9 were compared with matched, untreated centers with ratios averaging 1:9.1. In the Atlanta Public Schools experiment, however, PSI gains were slightly higher for three-year-olds in high-ratio classrooms (averaging 1:5.4) than in low-ratio classrooms (averaging 1:7.4), although no differences were found for four-year-olds, nor for either age group on the PPVT. Also, natural variations in ratio across the APS classrooms as a group were weakly associated with PSI gains, though the strength of this relationship was substantially less than that found for group size.

Group Size and Activity Subgroups

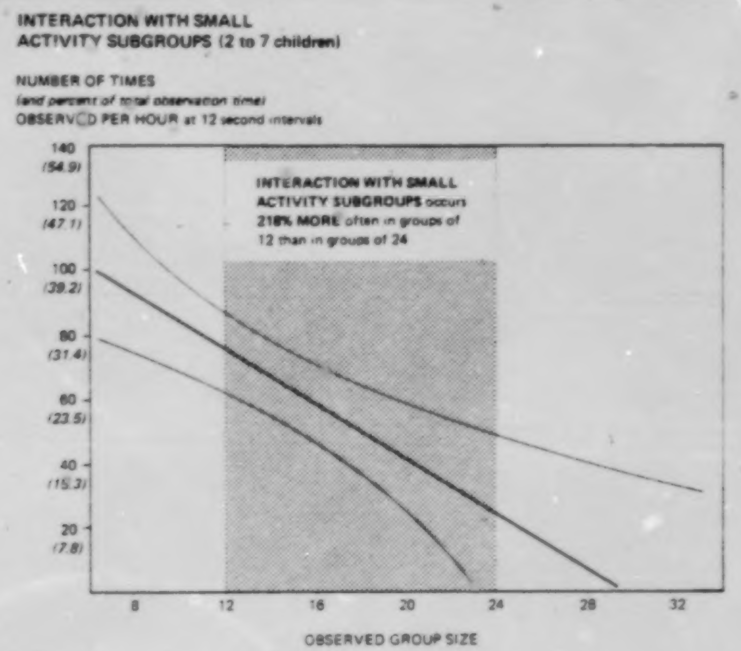
The classroom dynamics underlying the relatively powerful effects of group size and less powerful effects of ratio become clearer when the pattern of **activity subgroups** in the classroom is examined. An activity subgroup is the number of children actually interacting with a particular caregiver, as opposed to the total number of children under supervision of the caregiver or team of caregivers (the regulator's definition of *group size*, used throughout this report). A group, or class, of 12 children might, for example, be divided into three activity subgroups – one subgroup of six with the lead teacher, a subgroup of four with an aide and a subgroup of two working "independently." Indirect information on sizes of activity subgroups was available in the codes of the Adult-Focus Instrument which recorded numbers of children to whom the caregiver directed her attention at a given moment.

The number of children with whom the lead teacher interacts is more affected by total group size than by ratio. Although aides often take a *few* children aside for various activities (as described above for a group of 12), it is rare to find aides supervising substantial portions of a class for extended periods. Large groups tend not to be broken into roughly equal subgroups even when enough staff are present to allow such division. (For example, a group of 24 children with 4 caregivers would probably not be broken into 4 groups of 5-7 children each.) Even when aides take a few children aside, the lead teacher continues to supervise most of the class. Thus the effective child/staff ratio for lead teachers in large groups is often the total number of children present.

This point is illustrated in Figure 6.5. The figure shows that the lead teacher devotes progressively less time to interaction with small groups of children as the total number of children under her supervision grows larger. The opposite relationship holds for interaction with large subgroups (not illustrated). Further illustration, from the child's point of view, appears in Figure 6.6. Children in large classes spend more time in group interaction and less time interacting with adults than do their peers in small classes.

The above discussion may explain why group size exerts more influence on group dynamics, especially on caregiver behavior, than does ratio – why in fact many effects expected for ratio are found instead for group size. Sizes of activity subgroups in turn exert an influence on children's test score gains. In the case of the PPVT, the influence of subgroup size is far stronger than that of total class size. (See the section "Links Between Behavior and Test Scores," below.)

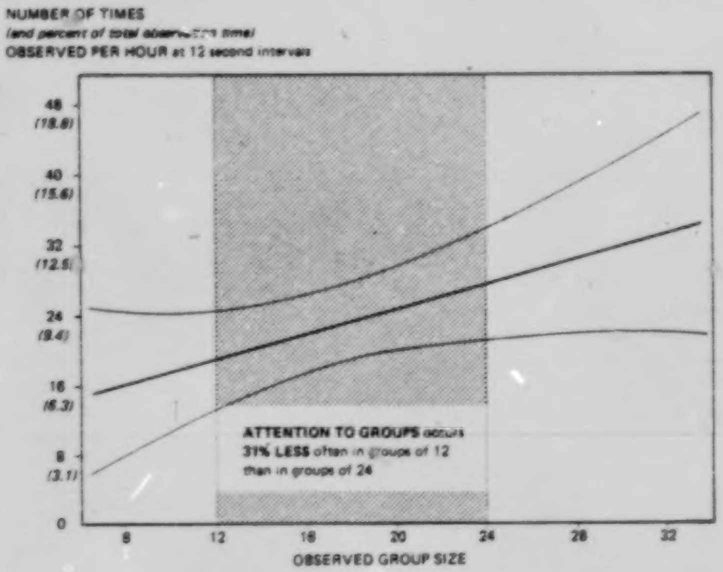
Figure 6.5: The Relationship between Lead Teacher Interaction with Small Activity Subgroups and Group Size



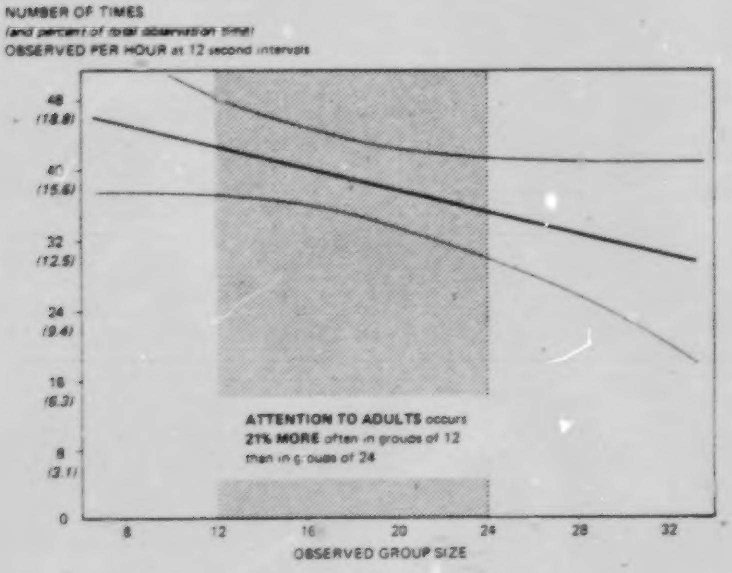
Shaded portions of figures, between group sizes of 12 and 24, correspond to the region in which the middle 75 percent of NDCS centers lie.

Figure 6.6: The Relationship between Object of Child's Attention and Group Size

A. ATTENTION TO GROUPS



B. ATTENTION TO ADULTS



Shaded portions of figures, between group sizes of 12 and 24, correspond to the region in which the middle 75 percent of NDCS centers lie.

EFFECTS OF CAREGIVER QUALIFICATIONS

As indicated in Chapter Three, the NDCS examined correlates of four components of caregiver qualifications: (1) years of formal education (regardless of subject matter or specialization); (2) presence or absence of specialized preparation relevant to young children, obtained either within a formal degree program or in a training program unrelated to any degree; (3) amount of day care work experience prior to the caregiver's beginning work at her/his current center; and (4) length of service in the current center. The APS experiment incorporated a direct manipulation of levels of education, permitting causal inference with regard to that variable. Natural variations in all qualifications variables were also examined, both in the APS and 49-center studies. The results can be summarized as follows.

First, amount of formal education, without regard for content, shows only a few scattered relationships to child and caregiver behavior and bears no detectable relationship to test score gains.[*] This conclusion is based on both the absence of effects of the APS experimental manipulation and the absence of systematic correlates of natural variations in both the APS and 49-center studies.

Education/training in child-related fields such as developmental psychology, day care, early childhood education or special education is associated with distinctive patterns of caregiver and child behavior and with higher gains in test scores for children. These patterns roughly parallel those associated with small groups, though they are not as strong or as widespread. Results for child-related education or training are elaborated below for caregiver behavior, child behavior, and PSI and PPVT gain scores.

Lead teachers with specialized education or training engage in substantially more social interaction with children (questioning, instructing, responding, praising and comforting) than caregivers without such education or training. This is illustrated in Figure 6.7.[**]

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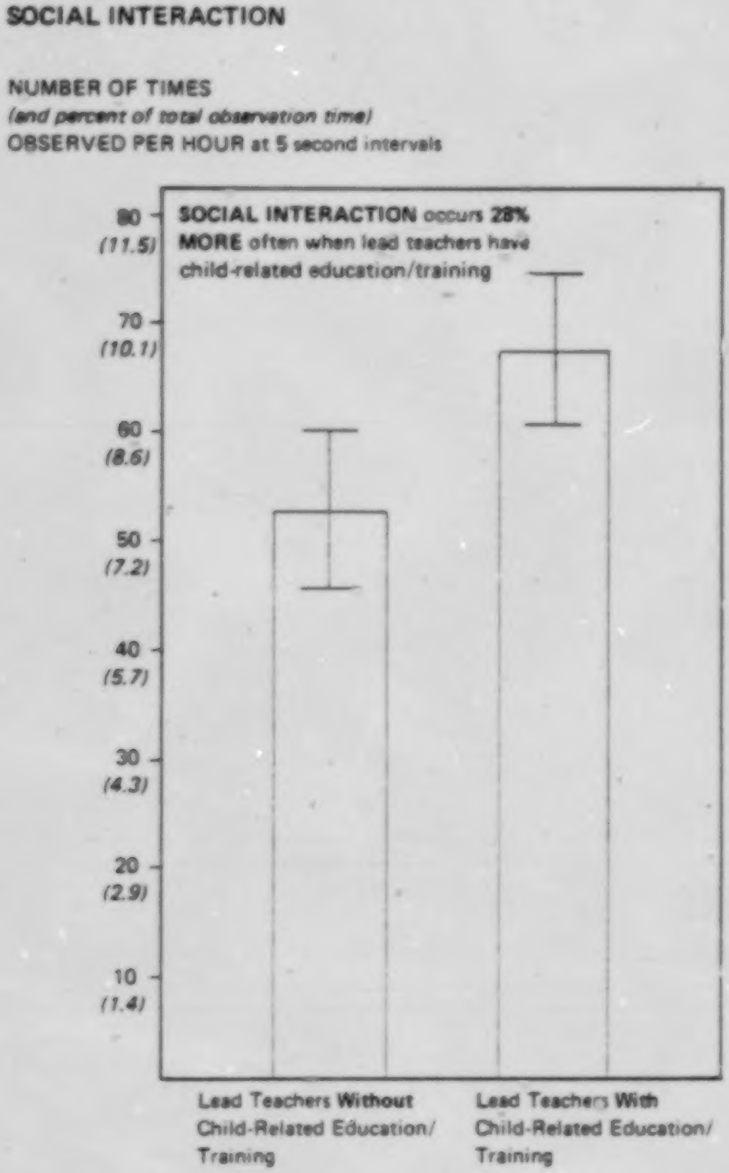
[*] The education of caregivers is negatively correlated with the socioeconomic status (SES) of children (see Chapter Three). Education appears to have some effects when child characteristics are ignored, but when effects of child SES are removed statistically, the apparent effects of education disappear.

[**] The figure is a bar graph rather than a line because there are only two possible conditions: lead teachers either have or do not have child-related education training. The "I"-shaped marker at the top of each bar represents the 95 percent confidence interval, corresponding to the thin curving lines in all other graphs. Again, reported results focus on lead teachers rather than aides, because too few aides have child-related training to permit meaningful comparisons among aides.

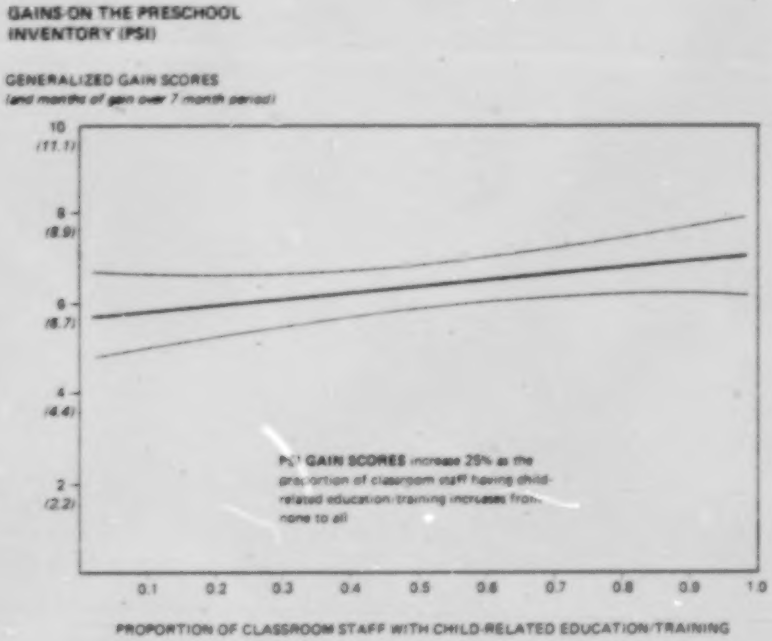
Figure 6.7: The Relationship between Lead Teacher Behavior and Lead Teacher Child-Related Education/Training



Children in classes led by caregivers with specialized preparation show more cooperation and compliance and are less frequently uninvolved in tasks or activities than children in other classes. They also show longer durations of attention to tasks or activities.

Test score gains are also affected by caregivers' child-related training, as shown in Figure 6.8.* Children in centers where all of the caregivers have child-related preparation gain 1.4 more points on the PSI from fall to spring than do children in centers where no caregivers have such preparation – a 25 percent advantage in growth rate for children in the former group, corresponding to a differential gain of 1.5 months over a seven-month period.

Figure 6.8: The Relationship Between Child PSI Gains and Classroom Staff Child-Related Education/Training (Center Average)



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* Children's behavior and test score gains were examined in relation to the proportion of all caregivers in each classroom or center who had child-related education training. Though the variable has only two possible values for each individual caregiver, it can take many values across the range from zero to one for a class or center, because there are different mixes of caregiver preparation within classes or centers. Both teachers and aides are included in calculations for classes and centers, because children's behavior and test score gains are presumably affected by all of the caregivers to whom children are exposed.

Finally, day care experience shows some effects in all three dependent domains – caregiver behavior, child behavior and test scores. However, as is the case for education, these relationships are inconsistent across data sets and are not readily interpretable. Many of the effects of experience are confined to a few centers where staff have worked in day care for a very long time. With these centers excluded from the sample, many effects of experience disappear.

Relationship between Formal Education and Child-Related Specialization

Given the Title XX goal of increasing employment opportunities for low-income people, an important policy question related to the above findings is whether child-related training is effective for individuals with little formal education, and, if so, what kind of training works best. Unfortunately, the study sample was not adequate to address these issues.

Many caregivers in the sample who had specialized in child-related areas did so in the context of a program of postsecondary education. Some, however, received their training in the context of a high school program, and a number of caregivers in Atlanta took a state-required 60-hour training course after high school but outside of any formal degree program. Most of these programs involved substantial amounts of practical field training, coupled with varying amounts of classroom training.

It would have been illuminating to compare subsamples of caregivers with little formal education – some with and some without specific types of child-related training. However, it was not possible to identify appropriate subsamples of sufficient size for statistical analysis. Thus it was not possible to determine whether child-related training is effective specifically for caregivers with little formal education. Similarly it proved impossible to identify subsamples that could be used to distinguish effects of the practical field component of this training from the classroom component. Nor was it possible to single out any particular curriculum or training approach as particularly valuable, although some suggestions in this regard emerged from comparison of data across sites, discussed in a later section, "Generality of Effects Findings."

Interchangeability of Education, Experience and Training

A second policy issue, on which NDCS findings do throw some light, concerns the interchangeability of education, experience and child-related training as avenues for preparation of competent caregivers. The 1968 FIDCR stipulate that "educational activities must be under the supervision and direction of a staff member *trained or experienced* in child growth and development," implying that training and experience are in some sense equivalent routes to competence. Many state regulations likewise imply interchangeability of training and experience, or education and experience. Often educational requirements are framed in terms of degrees or diplomas without regard for major area of study. NDCS data indicate rather clearly that neither education in fields unrelated to children nor day care experience per se is equivalent to child-related education/training. Policy implications of this conclusion are discussed in Chapter Eight. (Experience tends to have somewhat more widespread correlations with outcome measures than does formal education, particularly in the APS sample; but the correlates of experience, and the scattered correlates of education, do not parallel those of child-related education/training.

INTERACTIONS BETWEEN CLASSROOM COMPOSITION AND CAREGIVER QUALIFICATIONS

An important issue to consider in framing child care regulations is whether optimum group structures and optimum caregiver qualifications can be specified independently, or whether they are mutually contingent. For example, consider whether the optimum group size is the same for caregivers with and without education or training in a child-related field. Both of these variables, taken separately, contribute to quality in child care. It might be the case that caregivers with child-related education/training can effectively handle groups of widely varying sizes, while less qualified caregivers are effective only with smaller groups. (Such a situation would appear in the data as a statistical interaction involving child-related education/training and group size.) Alternatively, it might be the case that *all* caregivers, with and without appropriate training or education, are more effective with smaller groups, and that qualified caregivers are more effective than others with groups of any size.

The statistical power of the NDCS to detect interaction effects was limited. Unless such effects were large, they could not have been detected within the constraints of sample size. Subject to these limitations, no consistent interactions between composition and qualifications variables were found. Thus the most prudent conclusion to be drawn from NDCS data on interactions is that classroom composition and caregiver qualifications contribute independently to quality. *Benefits to children appear to be greatest when classroom composition and staff qualifications are both set at the optimum practically achievable levels.*

LINKS BETWEEN BEHAVIOR AND TEST SCORES

Further analyses were conducted to explore behavioral mechanisms linking classroom composition and caregiver qualifications to changes in PSI and PPVT scores, and to gain additional insight into the effects of regulatable characteristics on behavior in the classroom. These analyses showed that certain caregiver and child behaviors, which are influenced by group size and/or child-related education/ training of staff, in turn are associated with particularly rapid gains on one or both of the two tests, even with the policy variables controlled.

In centers where children show high levels of cooperation and compliance, PSI gains are large. Similarly, PSI gains are large in centers where children are frequently engaged in reflective, innovative behavior. In centers where children are allowed to wander aimlessly, uninvolved in tasks and activities, PSI gains are small. PSI gains are also somewhat sensitive to the degree of structure in classroom activities. Centers where structured activities predominate show higher gains than centers where unstructured activities predominate.

All of the above relationships are observed even when group size is held constant. Together with group size, various combinations of the child behaviors just listed explain up to 40 percent of total center-to-center variation in PSI gains. In light of the reliabilities of the various measures involved, this fraction represents a very substantial proportion of the variation that could possibly have been accounted for. These findings help put NDCS findings on test performance into perspective, showing that rapid gains do not somehow occur automatically in small classes. Rather, rapid gains can be expected where children are active and engaged. Activity and engagement are more common in small groups than in large ones – and when they occur, the prognosis for test performance is good.

Gains on the PPVT are linked to somewhat different aspects of classroom dynamics than are PSI gains. *As with PSI, reflective, innovative behavior of children is associated with rapid gains on the PPVT, and aimless wandering is associated with slower gains.* However, several caregiver behaviors that show no relationship to PSI gains do appear to affect PPVT gains: Gains are more rapid in centers where caregivers show high levels of interaction with children, both social (questioning, instructing, responding, praising and comforting) and managerial (commanding and correcting). Gains are also more rapid in centers where caregivers receive high ratings on the MANAGEMENT, CHILD ORIENTATION and global scales based on the CDA Checklist. Gains are slower in centers where caregivers spend relatively high proportions of their time observing children. When various caregiver behaviors are combined with information on the size of activity subgroups around the caregiver (discussed earlier), almost half of the center-to-center variation in PPVT gains is accounted for. Comparison of these results for the PSI and PPVT hints that PSI gains may depend somewhat more on the child's own activities, while PPVT gains are more responsive to interaction with the caregiver.

EFFECTS OF OTHER CENTER CHARACTERISTICS

As indicated in Chapter Four, the NDCS examined a number of other center characteristics, in addition to classroom composition and staff qualifications, as possible determinants of quality and cost. Preliminary investigations showed that two such characteristics – center philosophy/program orientation, and physical resources – could be examined statistically in relation to the study's process and outcome measures. These analyses revealed the following.

- In centers whose staff and directors voice concern with cognitive development and/or school readiness, children make significantly more rapid gains on the PSI than children in other centers. Effects of cognitive emphasis are independent of the effects of group size and child behavior on PSI gains. When effects of cognitive emphasis, group size, cooperation and reflective behavior are pooled, the four variables together account for 44 percent of total center-to-center variation in PSI gains.
- In centers where directors emphasize group experiences for children, rather than individual development, children have lower gains on the PPVT. This finding further buttresses the hypothesis that PPVT gains are responsive to interaction with caregivers rather than to children's interactions with the environment and other children.
- All NDCS centers met or exceeded state per-child space requirements (35 square feet). Variations in the amount of space available in each classroom above these minimums were not associated with variations in the behavior of caregivers or children's test scores. However, available space was correlated with frequencies of certain child behaviors, even when more powerful predictors such as staff/child ratio, group size and proportion of staff with specialized education/training were held constant. Larger spaces were associated with more reflection/innovation and attention to the environment but with less interaction with other children, whether individually or in groups. These associations, however, were weak and, in some cases, of marginal statistical significance.

One additional and very important center characteristic which was not part of the set of regulatable characteristics initially included in the study, but which was investigated in a preliminary manner, was racial and economic integration. Because the sample was not chosen to contrast integrated and segregated centers, effects of integration were difficult to separate from those of other factors. However, subject to this serious limitation, no effects of racial and economic integration on children's test scores could be found, when the effects of group size and caregiver qualifications were removed statistically.

GENERALITY OF EFFECTS FINDINGS

A major issue cross-cutting all of the effects findings reported above concerns the generality of the results – their consistency across portions of the NDCS sample, and their applicability to sites and populations other than those specifically examined in the NDCS. Consistency across subsamples increases confidence that overall results are not due to effects confined to one atypical part of the sample. Moreover, given that the sample was selected for socioeconomic, racial and geographic diversity, consistency of results supports the view that some determinants of quality in child care, as measured in the NDCS, are likely to be effective universally, rather than being confined in effectiveness to particular populations and locations.

To investigate these issues the NDCS sample was partitioned in various ways – centers serving low-income children versus those serving middle-income children; federally funded centers versus privately funded centers; classes of three-year-olds versus classes of four-year-olds. Effects analyses were carried out for these subsamples and the results compared. In addition, results of the APS study were compared with those of the 49-center study; and consistency of findings within the 49-center study was checked across the three sites – Atlanta (excluding APS centers), Detroit and Seattle. Results of these comparisons may be summarized as follows.

- Perhaps the finding most significant for policy is this: *both group size and child-related education/training show especially strong relationships to caregiver behavior and test score gains in* **public centers** *receiving most of their funds from the federal government.* In addition, in centers where mean family income falls below the average bracket for NDCS centers as a group ($6000-$9000 per year in 1976 dollars) relationships between test scores and these two key policy variables are stronger than in centers serving families with higher incomes. Thus, for several important outcome domains, regulatory devices available to the federal government are particularly effective for the populations and/or centers of greatest policy concern.

- Relationships between policy variables and quality measures are equally strong for three- and four-year-old children (as well as for the younger five-year-olds who were also included in the NDCS sample). Of course, the behavior of three- and four-year-olds differs on the average; for example, older children are more cooperative and persist longer at tasks and activities. However, children of both ages show more cooperation (and other behavioral differences listed earlier) in smaller groups than in large ones. There is no consistent tendency for group size to affect either three-year-olds or four-year-olds more; some relationships are a little stronger for younger children and some for older children. Overall, comparison of relationships across ages suggest no systematic difference in strength. This finding suggests that single, uniform set of regulations can potentially maintain quality for both age groups, although normal developmental differences between age groups will be evident if classrooms are composed and staffed in similar fashion.[8]

- Relationships between classroom composition and quality measures are similar in direction across the three sites of the 49-center study, indicating that group size and ratio are associated with quality despite wide variation in geographic, demographic and regulatory settings. However, the magnitudes of relationships vary from site to site, as does their statistical significance (largely because of variations in numbers of centers).

- In the domain of classroom composition, results of the APS study generally reinforce those of the 49-center study. Group size is the most powerful of the policy variables; in fact its relationships to child behavior and test scores are stronger in the relatively homogeneous APS sample than in the larger and more diverse 49-center sample. However, behaviors affected in the APS sample are not identical to those affected in the larger sample. (For example, smaller groups are associated with more interest/participation on the part of children in the APS study but not in the 49-center study.) Moreover, there are stronger hints of effects of staff/child ratio in the APS study than in the 49-center study.

- In the domain of caregiver qualifications, caregiver experience shows more widespread associations in the APS study than in the 49-center study, though these effects form a complex pattern that is difficult to interpret. Child-related education/training shows fewer effects in the APS study than in the 49-center study, probably because so many APS caregivers (85%) had specialized training in the APS centers, limiting the comparisons that could be drawn *within* these centers.

- Effects of child-related education/training are strong among Atlanta centers (APS and non-APS combined), weak in Seattle and nonexistent in Detroit. (When APS and non-APS centers are combined, the Atlanta centers collectively show a broad distribution in proportions of staff with child-related education/training.)

This last finding suggests a site-specific effect that deserves further elaboration. Because of sample sizes, power to detect effects is greatest in Atlanta, much less in Seattle and less in Detroit. In addition, there are many caregivers in Atlanta (particularly in APS centers) with relevant training, fewer in Seattle and a much smaller fraction in Detroit. Finally, child-related education/training in Atlanta is provided largely by a single institution, the Atlanta Area Technical School, which offers a state-required 60-hour "Basics" course as well as a two-year degree program.[9] In Seattle many but not all caregivers received relevant training through Seattle Community College. In Detroit, no one institution dominates training in day care, and many Detroit caregivers who reported having such training in fact had elementary school teaching certificates. In short, effects of child-related education/training were found most clearly where the study was best equipped to detect them – that is, where the variable was most clearly defined and had the most favorable distribution across the largest number of centers. Therefore, while the findings may be confined to a single site because of the characteristics of the sample just listed, the possibility remains open that effects of child-related education/training are widely generalizable.*

CONCLUSIONS

The conclusions drawn here are based on the assumption that fairly clear positive value can be placed on the pattern of outcomes found in the NDCS to be associated with small groups and with staff specialization in child-related fields. Most parents, day care providers, child advocates, developmental psychologists and policymakers would agree that it is good for caregivers to play an active role with children, good for children to behave in the ways shown earlier to be associated with small groups and appropriately educated or trained caregivers, and good for children to make higher gains on tests. Admittedly, there is room for disagreement about how important these different elements are for quality in child care, or about how much of a particular behavior is good. It is questionable whether sound policy recommendations could be based on any one or two of the study's dependent variables in isolation, and it is hard to see how any recommendations could have been reached if these indicators pointed in different directions (e.g., some suggesting that small groups are associated with higher quality). However, the consistent results that have actually emerged across different instruments and areas of measurement thus far allow unambiguous conclusions about which regulatable characteristics of centers are the best predictors of quality care for children.

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* There were no reversals of direction of effects of child-related education/training in Seattle or Detroit – i.e., no indications that such preparation on the part of caregivers is *not* beneficial for children. However, positive effects could not be detected, particularly in Detroit, probably because of factors cited in the text – lack of statistical power due to small numbers of centers and of caregivers with relevant preparation, and heterogeneity of training programs at these sites.

The convergence of effects and the value that can be placed on the pattern of effects that emerged in the study have broad implications for policy. These implications form part of the background for the specific policy analysis and recommendations in Chapter Eight.

First and most fundamentally, any regulatory strategy designed to insure maximum developmental benefits for children should specify allowable numbers of children and ratios of caregivers to children in each classroom group and should also require that at least one caregiver per classroom have specialized preparation in a child-related field. To achieve maximum effects, regulations cannot focus exclusively on any one component of group composition, caregiver qualifications, or any other factor that may be found important for quality of care, in isolation. To be effective, regulations should specify *configurations* of children and caregivers, with minimum qualifications defined for at least one caregiver.

Second, although staff/child ratio regulations have been the focus of most public attention and controversy, clear findings on the importance of group size suggest a shift in emphasis toward this more easily understood and measured factor. This shift in emphasis does not mean that ratio requirements can be omitted from future versions of state and federal regulations. As illustrated in Chapter Four, ratio and group size are closely linked. There is little justification in NDCS results for ratio regulations more stringent than the current FIDCR ratio requirements. On the contrary, current findings appear to indicate that ratios slightly to moderately below those permitted by the present FIDCR can be consistent with positive day care environments for children if group size limits are appropriately set.

Third, even in effective centers, group sizes and staff/child ratios vary by time of day, type of activity, season of the year and often by children's ages. Therefore, while standards themselves must be specific, regulatory codes and monitoring practices should be designed to take this dynamic aspect of center care into account.

Finally, because no major differences in directions of effects from site to site have emerged, the study offers no evidence that group composition and staff qualifications should not be included in a single set of nationally applicable standards.

CHAPTER SEVEN: LINKS BETWEEN POLICY VARIABLES AND MEASURES OF COST

The cost findings[1] of the National Day Care Study (NDCS) include: (1) descriptive data on income and expenditure patterns in Phase III centers, comparing parent-fee and publicly funded centers to each other and comparing the NDCS centers to a national cost profile taken from the NDCS Supply Study (see Appendix A); (2) the outcome of analyses exploring the relationships between key policy variables and costs; and (3) the results of a simulation of the national cost and market impact of alternative policy configurations using data from the NDCS Supply Study. This chapter discusses the first two types of findings. The national cost and market implications of alternative federal day care requirements will be discussed in detail in Chapter Eight.

OVERVIEW OF FINDINGS

In general, findings in the first two categories confirm the results of earlier day care cost studies.* Differences in the per-child cost of center-based day care can be explained largely by differences in centers' program characteristics.

A center's caregiver/child ratio is the single most important determinant of cost per child. Even small differences in ratio can result in large differences in cost. Group size *alone* does not have a significant effect on a center's cost. To the extent that smaller group sizes increase the *number* of defined physical areas necessary to serve a given center enrollment, occupancy costs increase, but because occupancy accounts for only a small part of total center costs (9%), the resulting increase in cost per child is small.

The cost of care, then, is critically affected by a center's caregiver/child ratio. Actual ratios, however, do not coincide with ratios permitted by regulation. Centers serving subsidized children have more staff and consistently maintain ratios substantially higher (1:5.9) than specified in state licensing codes (which average 1:12.5) and even exceed FIDCR staffing requirements (1:6.4). Centers serving no subsidized children also have more staff than specified in the relevant state minimum requirements, and on average maintained ratios close to those of centers serving subsidized children (1:7.6), a much smaller ratio differential than might have been expected.

In fact, most subsidized and parent-fee centers provide care at ratios higher than the irrespective averages.** This pattern, which may well reflect the true dynamics associated with caring for young children over long periods of the day, should be considered in setting future regulations and reimbursement rates.

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* The policy simulations have no precedent because national data have not been previously available.

** Supply Study data show an estimated 73% of publicly funded centers with ratios of 1:6 or higher and 65% of parent-fee centers with ratios of 1:8 or higher.

Caregiver qualifications – formal education, day care experience, and child-related education/training – were found to have only a slight impact on caregiver wage rates. As a result, variations in caregiver qualifications have a negligible impact on the total cost per full-time-equivalent (FTE) child in care. However, overall caregiver wage rates, regardless of individual qualifications, are extremely low. Although most caregivers (69%) provide more than half of their family's income, and 30 percent are the sole income earners for their families, only 10 percent of caregivers earn enough to support a family at or above the low income level defined by the Department of Labor for a family of four ($10,000). Thus the cost of raising caregiver wages to a more livable level would have a substantial impact on the cost of care. This issue warrants consideration in setting reimbursement rates.

Chapter Eight will consider the implications of these findings, and the simulation results in conjunction with the effects findings presented in Chapter Six, for setting future regulations and administrative practices.

A CONTEXT FOR NDCS COST FINDINGS

Just as there is a need to know the impacts of policy decisions on the quality of care for children, the cost structure and dynamics of center day care must also be understood if complex trade-offs between quality and cost are to be identified and their implications addressed.

For example, if a more desirable outcome for children in day care can be purchased with little or no increase in cost, then a policy decision to purchase "better" care is straightforward. On the other hand, if a particular desirable child outcome is very costly per child, a more difficult policy decision arises: whether to provide adequate care to more children, or "better" care to fewer children, given a fixed amount of public monies.* For example, as shown below, the cost of maintaining high staff/child ratios can be weighed against the cost of increased wages paid to caregivers. If higher wages directly benefit caregivers (and perhaps children indirectly), and if small reductions in ratio do not reduce the quality of care, then lowering ratios and paying higher wages to caregivers is a viable option. Conversely, serving more children by increasing the number in the care of each caregiver may be seen as a "better" choice than paying higher wages. Such issues, not easy to resolve since they involve competing values and interests, are at the heart of policy considerations concerning both the general federal role in day care and specific FIDCR revisions.

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* The NDCS has assumed a *constant cost*, rather than *least cost* position. The constant cost position assumes that a fixed budget represents a decision to spend the total amount of funds budgeted for the purposes intended – the issue then, is how to spend the fixed amount as effectively as possible. Any savings that can be realized by a reduction in spending in one program area will be internally reallocated to produce greater effectiveness in another. The least cost position assumes that any savings realized will be used to reduce the total amount spent, presumably for other public purposes such as reduction in taxes, increase in program funds in other areas deemed more critical, and so forth.

Chapter Six focused on the relationships between regulatable center characteristics and quality of care, the heart of the first of the three major policy questions addressed by the NDCS. The second major policy question relates to the cost of care, the focus of this chapter.

- How is the per-child cost of center-based day care affected by variations in staff/child ratio, staff qualifications, group size and other regulatable center characteristics?

This question was addressed by examining cost data from 64 Phase II centers and 57 Phase III centers.** These data were analyzed descriptively and comparatively, and were also subjected to the more complex statistical techniques (multiple regressions) needed to uncover the relationships between center characteristics and costs.

Answers to the first two policy questions provided the foundation for the NDCS examination of the third major policy question (the focus of Chapter Eight):

- How does the cost-effectiveness of center-based day care change when adjustments are made in regulatable center characteristics?

However, to assess the impact of the cost/effects findings on a national basis, a broader set of data was also needed.

The National Day Care Supply Study provided the national data on key program and financial characteristics of centers needed to estimate the impact on centers of alternative federal day care regulations. With the insight gained through the study of the NDCS centers and the more than 3100 randomly selected centers in the Supply Study sample (17.3% of all centers nationally), it was possible to develop an econometric model which could test the complex interactions between program practices and costs and predict the changes in centers likely to result from changes in government regulations.

** Although cost data were gathered on all 57 Phase III centers, one center's cost data were unreliable and could not be used. All financial analyses reported here were conducted on the 56-center sample.

THE NDCS RESEARCH COST ACCOUNTING SYSTEM

NDCS staff designed a Research Cost Accounting System (RCAS) to collect financial data monthly. The core of the data collection system was a Statement of Current Income and Expense, used to record cash income and in-kind donations as well as cash and imputed expenses. The RCAS conformed to generally accepted accounting practices.* Income and expenditures were recorded in considerable detail by categories which permitted consistent comparisons across centers and across months of the year. Reporting forms were designed to permit computerized checks by NDCS staff for computational errors in recording information and for consistency of data received from one month to the next.

Various worksheets were provided to the centers to aid in the preparation of the income and expense statement – to record the quality and value of donated goods and services, and the depreciation expenses associated with purchased assets. To minimize the reporting burden imposed on centers and to ensure reliability of recorded information, data collection forms were tailored to the financial recordkeeping systems of individual centers. In addition, a number of adjustments had to be made to deal with problems specific to centers which were part of a larger organization or part of a chain of centers. In some of these centers, separate recordkeeping systems had to be set up to distinguish income and expenditures attributable to the individual center from the commingled financial records of the parent organization. In others, donated space was provided by sponsoring agencies. A consistent plan for valuation of this space was devised, using floor plans for the centers and an imputed rental rate based on local market values and on the location and characteristics of the physical facility used by the center. In 18 centers, a portion of salaries of indirect administrative staff (e.g., a bookkeeper at the parent organization) had to be allocated to the individual study center. Data from these individualized forms were later reclassified into the standardized income and expenditure categories listed above. These procedures ensured that data within each category would be comparable across centers.

Financial data collected by the RCAS were linked on a monthly basis to program information collected from each center as part of the general data system for NDCS centers. The program information required to conduct the financial analysis included data on enrollment, attendance, staffing patterns and services provided, as well as salaries and background information on all center staff. With these data, it was possible to determine the relationships between financial status and center characteristics, especially cost of day care per child.

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* The financial data and the instruments used to collect them were reviewed by an independent accounting firm. This review concluded that the RCAS provides reliable financial representations of the day care centers included in the study. A more detailed report on the RCAS (including the audit report), the NDCS Cost model and the NDCS Econometric Model will be found in Volume IV-C of the NDCS Final Report."

CLASSIFICATION OF NDCS CENTERS FOR POLICY ANALYSIS

The first issue to be addressed in determining the cost structure of NDCS centers was the appropriate classification of centers for the purposes of policy analysis. A clear typology was needed both for comparison and for determining the economic "behavior" of centers; such an understanding is required to develop a cost model that can be used both to explore current dynamics and to predict future impact on centers of such external changes as shifts in federal regulation.

Traditionally, day care centers are divided according to **legal status** into two broad groups: nonprofit centers and **profit centers**. These categories are further subdivided into **independent centers** and **group** or **sponsored centers**. The population of interest in the NDCS, as indicated in earlier chapters, is children receiving or eligible to receive federal and state subsidies.

The NDCS centers were not drawn from a national probability sample; rather, centers were selected in order to achieve the needed representation of low-income children and the centers that serve them. The selection process resulted in a disproportionate representation of nonprofit centers in the NDCS sample. Table 7.1 compares the legal status of the NDCS centers to that of centers nationally. Only 18 percent (10 centers) of the NDCS centers are organized in a for-profit basis compared to 41 percent of centers nationally.

Families with low incomes tend to use nonprofit centers. Half of all profit centers serve some families with incomes under $6000 (1976 dollars), but only 9 percent have over half such families. In contrast, 85 percent of nonprofit centers serve some low income families.* For this reason, classification by auspices was not com-

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* Although this issue was not directly studied in the NDCS, at least three reasons for this pattern were noted during site development: first, although resource costs per child (cash expenditures plus donations) are generally higher in nonprofit than in for-profit centers, because of donations, fees are often lower. Among nonsubsidized centers, for example, average weekly fees (in 1976 dollars) for profit centers were $25.20/week nationally, for nonprofit $24.40/week; second, both by policy and practice, many state and local agencies subsidize care only through nonprofit centers; finally, even where for-profit centers are eligible to provide subsidized care, these centers choose not to because it may mean additional administrative burden and raising their rates to fee-paying parents.

Table 7.1: Distribution of Centers by Legal Status

Type of Organization	Percent NDCS Centers (N = 56)[a]		Percent Centers Nationally (N = 2496)[b]	
Profit	18%		41%	
(Independent)		(9%)		(35%)
(Group)		(9)		(6)
Nonprofit	82		59	
(Independent)		(41)		(19)
(Sponsored)		(41)		(40)
Total	100%		100%	

[a] One of the 57 Phase III center's cost data could not be used.

[b] Data from the Supply Study.[3]

pletely adequate. A decision was made to select a direct measure distinguishing the population of interest, and centers were accordingly classified on the basis of the sources of their operating funds.

Thus for descriptive purposes the NDCS centers were grouped into two clusters:

- *parent-fee centers* – those centers which received more than half their total income from parent fees: and
- *publicly funded centers* – those centers which derived more than half their total income from sources other than parent fees (principally government reimbursements, such as Title XX, matching state funds, Department of Agriculture food subsidies: and gifts and contributions).

These two groups of centers differ markedly not only by income characteristics, but also by costs and program characteristics, as discussed below.

Table 7.2 indicates that across all NDCS centers, parent fees accounted for an average of 40 percent, and government payments, 48 percent of center income: gifts, contributions and miscellaneous sources accounted for the remaining 12 percent of center income. Figure 7.1 shows the distribution of NDCS centers by the percentage of center income derived from parent fees. At one end of the distribution, 41 percent of centers received more than half their income from parent fees: at the other end, 41 percent of centers derived no more than 5 percent of their income from parent fees. Only 18 percent of NDCS centers fell between these two extremes.

Table 7.2: Sources of Center Income

Sources of Income	NDCS Centers[a]						Centers Nationally[b]
	Parent-Fee Centers		Publicly Funded Centers		All NDCS Centers		
Parent Fees	83%		11%		40%		70%
Government Payments	15		69		48		29
(Subsidies)		(11%)		(58%)		(40%)	
(USDA Food Monies)		(4)		(11)		(8)	
Contributions	2		21		12		2
(Cash)		(0)		(8)		(4)	
(In-kind)		(2)		(13)		(8)	
All Sources	100%		100%		100%		100%
	N = 23		N = 33		N = 56		N = 1518[c]

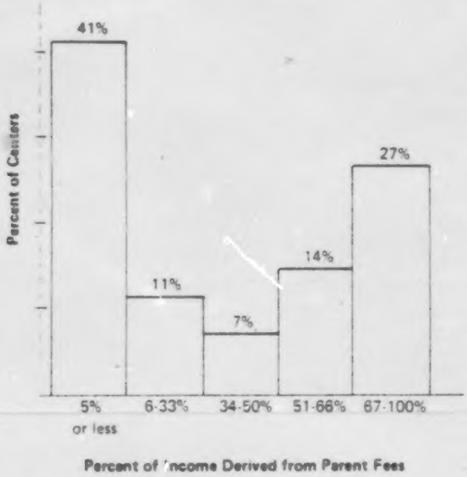
Details may not sum due to rounding.

[a] Centers received equivalent grants from the NDCS so they could employ center secretary/data collectors. This grant, averaging 8% of center budgets, has been excluded here for comparative purposes.

[b] Data from the Supply Study.[4]

[c] Valid data on both income and expenditure were available for about one-half of the Supply Study sample.

Figure 7.1 Distribution of NDCS Centers by the Percentage of Center Income Derived from Parent Fees



COST STRUCTURE OF NDCS CENTERS AND COMPARISON WITH CENTERS NATIONALLY

This section presents an overview of the cost structure of the NDCS centers. Three points need to be emphasized.

- The financial data are for the period April 1976 to March 1977, and are now two years out of date.

During the two year period 1976-1978, prices have risen nationally by approximately 15.4 percent. It is estimated that the cost data reported here probably *understate* the current cost of providing center-based day care by approximately that amount as of September 1978.

- The data reflect *total resource cost rather than cash expenditures alone;* that is, the estimated cash value of donated goods and services and an estimate of depreciation were included in income and cost figures.

The use of *resource cost* rather than *cash expenditures* is especially important when relating cost to program characteristics across center types. As seen in Table 7.2, in-kind contributions (donated services, supplies and space) accounted for an average of 13 percent of the resources used by the study's publicly funded centers, but only 2 percent of the resources used by the study's parent-fee centers. Unless these in-kind resources are accounted for, it is impossible to estimate the "true" cost of providing comparable day care services in alternative settings.

- Differences in total cost per child between parent-fee and publicly funded centers are explainable in terms of program differences.

Although this point will be elaborated in the next section, it is important that it be established at the outset. With the exception of differences in cost due to variations in wage rates, centers that show a higher per-child cost generally have higher ratios, more supplementary services or both.

Table 7.3 shows that across all NDCS centers, average monthly resource cost per full-time-equivalent (FTE) child was about $157. There was little difference in the average cost per FTE child among the three study sites (not shown). Atlanta had the highest average cost per child ($159 per month) and Detroit the lowest ($154 per month). The average cost per child in Seattle was $156 per month.

There was a substantial variation in resource cost per FTE child across the NDCS centers, ranging from a low of $80 per month to a high of $281 per month. As seen in Table 7.3, the average cost per child in parent-fee centers was considerably lower than that in publicly funded centers ($130 vs. $176 per month).[5] There was also much less variation in income cost per child among parent-fee

Table 7.3: Allocation of Monthly NDCS Resource Costs Per Full-Time-Equivalent Child[a] by Center Type

	NDCS Centers					
	Parent Fee Centers		Publicly Funded Centers		All NDCS Centers	
Cost Category	Cost Per FTE Child	%	Cost Per FTE Child	%	Cost Per FTE Child	%
Personnel	$ 79	61%	$ 130	74%	$ 109	69%
(Salaries)	($ 71)	(55%)	($ 109)	(62%)	($ 93)	(60%)
(Fringe Benefits)	(5)	(4)	(11)	(6)	(9)	(5)
(Donated Services[b])	(3)	(2)	(10)	(6)	(7)	(4)
Occupancy	20	15	21	12	21	13
(Rented/Owned)	(20)	(15)	(13)	(7)	(16)	(10)
(Donated Subsidized)	(0)	(0)	(8)	(5)	(5)	(3)
Supplies	15	12	19	11	18	11
(Food)	(9)	(7)	(13)	(7)	(11)	(7)
(Classroom)	(3)	(2)	(3)	(2)	(3)	(2)
(Other)	(3)	(3)	(3)	(2)	(4)	(2)
Other	16	12	6	3	9	6
Total (1976 dollars)[c]	$ 130	100%	$ 176	100%	$ 157	100%
(Estimated 1978 dollars)	($143-148)		($194-197)		($173-176)	
	N = 23		N = 33		N = 56	

Details may not sum due to rounding.

[a] For the period April 1976 to April 1977.

[b] Includes, for NDCS centers, salaries paid by outside agencies such as CETA.

[c] Since that time prices have risen 15.4%. It is estimated that these figures understate costs by approximately two-thirds to three-quarters of that amount (10 to 12 percent) as of September 1978.

centers – 61 percent had an average cost per child between $101 and $150 per month, and in only one center did this cost exceed $200. In contrast, only 27 percent of the publicly funded centers had an average monthly resource cost per child of $150 or less, and 20 percent had an average cost in excess of $200.*

Not surprisingly, personnel expenses accounted for the bulk of center resource costs. Centers spent an average of $109 monthly per FTE child on personnel, or about seven out of every ten dollars spent per month. Thirteen percent of monthly expenses ($21 per child) was spent for occupancy, and the remaining 17 percent ($27 per child) was spent for supplies, equipment and other operating costs. The NDCS centers operated at slightly above the break-even level with income exceeding expenditures by an average of 8 percent.

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* Some centers raised substantial amounts through donations of cash and in-kind resources.

The major difference in costs across center types is in personnel expenditures, due to differences in staff/child ratio, noncaregiving staff costs, and wage rates (see below). Average monthly personnel cost in the study's parent-fee centers was $79, compared to $130 in the study's publicly funded centers. Personnel costs differed not only in absolute cost, but also in relative terms: parent-fee centers allocated 61 percent of their resources to personnel, whereas publicly funded centers allocated 74 percent.

As noted earlier, because the Phase III NDCS centers were not drawn from a national probability sample, one cannot assume that the cost structure of the study centers is representative of day care centers nationally. In addition to the major 3100-center survey, a national probability sample of 70 day care centers was also used in the NDCS Supply Study to collect more detailed cost data by on-site interviews. Financial information was collected using a modified version of the RCAS Statement of Income and Expense.* The on-site survey was designed to provide information that is statistically generalizable to the national level. Table 7.4 compares the cost structure of the NDCS centers with the Supply Study on-site survey centers. This comparison provides another indication of the degree to which the cost structure of the Phase III NDCS centers is representative of day care centers in general.**

For comparative purposes, the centers participating in the Supply Study survey have been grouped on the basis of their primary source of income. Table 7.4 shows that the cost structure of the NDCS centers is quite similar to that of the on-site Supply Study centers. Among publicly funded centers, the difference in total monthly cost per child between the NDCS and Supply Study centers is not statistically significant. The only significant differences occur in occupancy costs (where the difference is attributable to an absence of an imputed value for donated space for the on-site centers) and in the catch-all category "other." Although the total monthly cost per child in the NDCS parent-fee centers is significantly higher than that of the Supply Study parent-fee centers ($p < .10$), the only significant difference among the major cost categories is in the "other" category. The values for all NDCS centers compared with all Supply Study on-site survey centers show no statistical difference. It appears, then, that in a broad sense the cost structures of the NDCS centers are representative of the cost structures of day care centers nationally.

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* Data were collected in more detail than in the telephone survey, but considerably less detail than in the RCAS. A value of $5 per month per child for donated services was developed from the data. In addition, because field time constraints prohibited an attempt to impute a value to donated/subsidized space, for comparative purposes the $3 per month per child national estimate was included here.

** A more detailed discussion of the generalizability of the NDCS sample is contained in Volume IV-B.[6]

Table 7.4: Allocation of Monthly Resource Costs by Center Type in NDCS[a] and Supply Study On-Site[b] Centers

	Parent Fee Centers					Publicly Funded Centers					All Centers				
	NDCS		On-Site			NDCS		On-Site			NDCS		On-Site		
Cost Category	Cost Per Child	%	Cost Per Child	%	Significance Level[c]	Cost Per Child	%	Cost Per Child	%	Significance Level	Cost Per Child	%	Cost Per Child	%	Significance Level
Personnel	$ 79	61%	$ 71	66%	n.s.	$ 130	74%	$ 146	78%	n.s.	$109	69%	$ 115	74%	n.s.
(Salaries/Fringe Benefits)	($ 76)	(59%)	($ 66)	(61%)	n.s.	($ 120)	(68%)	($ 129)	(70%)	n.s.	($ 102)	(65%)	($ 103)	(66%)	n.s.
(Donated Services[d])	(3)	(2)	(5)	(5)	n.s.	(10)	(6)	(17)	(9)		(7)	(4)	(12)	(8)	n.s.
Occupancy	20	15	20	18	n.s.	21	12	12	7	p<.01	21	13	19	12	n.s.
(Rented/Owned)	(20)	(15)	(10)			(13)	(7)	(7)	(4)		(16)	(10)	(16)	(10)	
(Donated/Subsidized)	(0)	(0)	(11)			(8)	(5)	(5)	(3)		(5)	(3)	(3)	(2)	
Supplies	15	12	15	14	n.s.	19	11	18	10	n.s.	18	11	17	11	n.s.
(Food)	(9)	(7)	(11)	(10)	n.s.	(12)	(7)	(13)	(7)	n.s.	(11)	(7)	(12)	(8)	n.s.
(Classroom/Other)	(6)	(5)	(4)	(4)	n.s.	(6)	(4)	(5)	(3)	n.s.	(7)	(4)	(6)	(3)	n.s.
Other	16	12	3	3	p<.01	6	3	10	6	n.s.	9	6	7	4	n.s.
Total (1976 dollars)[e]	$ 130	100%	$ 108[f]	100%	p<.10	$ 176	100%	$ 186[f]	100%	n.s.	$157	100%	$ 158[f]	100%	n.s.
(Estimated 1978 dollars)	($ 143 $ 146)		($ 119 $ 121)			($ 194 $ 197)		($ 202 $ 206)			($ 173 $ 176)		($ 171 $ 174)		
	n = 23		n = 26			n = 33		n = 37			n = 60		n = 62[g]		

Details may not sum due to rounding.

[a] For the period April 1976 to April 1977.

[b] During the month of March, 1977.

[c] Significance Level: n.s. indicates that differences between NDCS and On-Site Centers were not statistically significant at the .10 level of confidence.

[d] Includes salaries paid by outside agencies such as CETA.

[e] Since that time prices have risen 15.4%. It is estimated that these figures understate costs by approximately two thirds to three quarters (10 to 12 percent) of that amount as of September 1978.

[f] For comparative purposes, includes an estimated $ 3 per month per child for donated/subsidized space derived from the national supply study sample. See Chapter Note 6.

[g] Eight of the 70 on-site Supply Study centers' cost data could not be used.

RELATING PROGRAM CHARACTERISTICS TO CENTER TYPES

Before proceeding to a discussion of the relationship of day care costs to program characteristics, it is important to review briefly the programmatic differences between parent-fee and publicly funded centers.

Tables 7.5 and 7.6 present summary measures for classroom composition, caregiver qualifications and the general characteristics that were found to have the greatest impact on costs when measured for the entire center. As with any organization, center averages are the appropriate level for cost analysis; this is a usual and widely understood practice and for policy purposes the center-level per-child cost has long been the yardstick for program comparisons. Resources can be allocated differently from group to group within a center with no effect on center costs.[*] Since cost analysis was conducted at the center level and the effects analyses reported in Chapter Six were done at the level of the target classroom and center averages of target classrooms, the data presented in Tables 7.5 and 7.6 are not strictly comparable to similar measures reported in Chapter Three, with the exception of group size.[**]

The average caregiver/child ratio (adjusted for absenteeism) for all children in NDCS centers was 1:5.7. Parent-fee centers tended to have more children per caregiver than publicly funded centers (6.4 vs. 5.3).[§] Forty-three percent of the parent-fee centers had eight or more children for every caregiver. In contrast, only 19 percent of the publicly funded centers had as many as eight children per caregiver. At the other extreme, only 17 percent of the parent-fee centers had fewer than six children per caregiver, whereas 42 percent of the publicly funded centers had ratios higher than 1:6.

Noncaregiving staff include directors and other administrative staff, as well as staff who provide supplemental services to children and families. Parent-fee centers had fewer noncaregivers per child than publicly funded centers (1:12 vs. 1:10).

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[*] It should be noted that the simplicity inherent in this measure carries with it the danger of obscuring enormous differences in actual within-center cost per child. As an example, it is not even necessary to calculate staff costs under the FIDCR ratio requirements for infants and toddlers (1:4) and school age children between six and nine (1:15) to sense the potential magnitude of such cost differences. If not taken into account, such differences can produce strong incentives for providers to favor caring for older children.

[**] Group size data were collected by observation for three- and four-year-old classrooms only.

[§] These caregiver/child ratios have been computed by dividing total caregiver hours per week by total child-hours per week, adjusted for absenteeism. This measure approximates the actual staff contact available to children at the center.

Table 7.5: Classroom Composition and Caregiver Qualifications by Center Type

	NDCS Centers		
	Parent-Fee Centers	Publicly Funded Centers	All NDCS Centers[a]
Classroom Composition			
Caregiver/Child Ratio			
(center level) – Enrolled:	1:7.3	1:6.0	1:6.5
Adjusted for Absences:	1:6.4	1:5.3	1:5.7
Non-Caregiver/Child Ratio (center level)	1:12	1:10	1:11
Group Size (3-and 4-year-old classrooms) – Enrolled:	19.7	19.7	19.7
Adjusted for Absences:	17.6	17.6	17.6
Caregiver Qualifications			
Years of Education			
Teachers	14.1	14.5	14.3
Aides	12.5	13.0	12.8
Percent of Caregivers with Child-Related Education/Training			
Teachers	44	66	56
Aides	19	49	39
Average Years Day Care Experience			
Teachers	2.7	4.2	3.5
Aides	1.2	2.5	2.1
Experience in Current Center (Years)			
Teachers	2.2	3.3	2.8
Aides	0.8	2.0	1.6
Average Hourly Wage Rate (Including Fringe Benefits)			
Teachers	$2.99	$3.85	$3.47
Aides	2.63	3.35	3.15
	N = 23	N = 33	N = 56

[a] Except for group size, data are at the center level for all ages of children. This accounts for minor differences between these data and those reported in Figures 3.1 - 3.3.

Table 7.6: Percent of Centers Providing Selected Supplemental Services by Center Type

Supplemental Services	Percent of NDCS Centers		
	Parent-Fee Centers	Publicly Funded Centers	All NDCS Centers
Screening or Testing	61%	85%	75%
Provide Immunizations	9	55	36
Other Health Services to Children	26	58	45
Special Educational Services	30	30	30
Special Nutrition Services	30	42	38
Family Health Services	22	52	39
Referrals to Social Service Agencies	39	85	66
Other Family Services	9	33	23
Transportation	57	70	65
	N = 23	N = 33	N = 56

No differences were found in the size of groups across center types. After adjusting for absenteeism, the average number of children per group was 17.6 in both parent-fee centers and publicly funded centers (in three- and four-year-old classrooms).

Caregivers in publicly funded centers had, on average, slightly more formal education and considerably more day care experience than caregivers in parent-fee centers. Caregivers in publicly funded centers were, moreover, far more likely to have had child-related education/training than were their counterparts in parent-fee centers.

In addition to core care, day care centers offer a wide variety of supplemental services to children and their families. The specific services offered by a center reflect the needs of the center's client population, as well as the effects of government day care regulations and funding. The services offered by NDCS centers are shown in Table 7.6.

In general, publicly funded centers tended to provide supplemental services with far greater frequency than did parent-fee centers. The differences were especially pronounced in health and social services. Publicly funded centers were more than five times as likely to provide immunizations and about twice as likely to provide other health services to children or their families than were the study's parent-fee centers. As indicated above, these differences probably reflect, in part, the differences in the needs of the children and parents served (only 14% of the children in parent-fee centers came from families with annual incomes of less than $6000, compared to 73% in the publicly funded centers), and in part the differences in funding sources and federal and state day care regulations.

RELATING PROGRAM CHARACTERISTICS TO COSTS

Differences in center costs can result from:

- differences in program characteristics among centers;
- differences in scale economies which result in some centers operating at inefficient levels; and
- differences in the salaries paid by centers to equivalent staff.*

From a policy perspective, however, it is the first category, cost differences which result from differences in center programs and practices, that is most relevant. Indeed, the primary focus of NDCS cost analysis was to relate differences in per-child costs to differences in regulatable center characteristics. The specific objective of the NDCS financial analysis was to determine how the per-child cost of center-based day care is affected by variations in staff/child ratio, group size, staff qualifications and other regulatable center characteristics. To accomplish this, a cost model of NDCS day care program and financial factors was developed based upon financial and program data from the NDCS centers.

This model identified the key elements affecting cost per child in the study centers, and formed the basis for the development of the National Supply Study Econometric Model used to estimate changes in the cost per child nationally which would result from changes in regulatable characteristics (discussed below).

The results of the NDCS cost analyses are consistent with the results of earlier day care cost studies – staff/child ratios, the use of noncaregivers (associated primarily, though not exclusively, with the delivery of supplemental services), and caregiver wage rates are the most powerful predictors of cost per child for day care services.[7] This result is not at all surprising in light of the large proportion of resources devoted to personnel expenditures in the day care industry. Furthermore, the high degree of reliability of the financial data used in the NDCS cost analyses increases the confidence that can be attached to these findings.

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* In a labor-intensive industry such as day care, with personnel expenditures accounting for between 60 and 80 percent of total expenditures, differences in cost per child are much more sensitive to differences in wage rates than to differences in the price of other factors such as occupancy or supplies. Strictly speaking, cost differences can result from price differences for any equivalent factor.

Caregiver/Child Ratio

The concept of a caregiver/child ratio is complex, both as it relates to program analysis and to cost analysis. Ratios may be measured at the group level or at the center level. In addition, there are a variety of alternative computational procedures for measuring ratio, each of which yields a different numerical value.* From a cost perspective, it is most useful to measure ratio at the center level. Since the cost of maintaining high caregiver/child ratios in some groups may be offset by maintaining low ratios in all groups, the overall cost per child in a center is related not to the ratio that prevails in any individual group, but rather to the ratio of *all* caregivers in the center to *all* children in the center. It is important to keep this point in mind when considering the cost impact of increasing (or decreasing) the caregiver/child ratio in some, but not all, groups in a center. Consider, for example, a center consisting of the following groups of children and caregivers.

	Age of Child			
	Three	Four	Five	Entire Center
Number of Children	15	15	15	45
Number of Caregivers	3	2	2	7
Caregiver/Child Ratio	1:5	1:7.5	1:7.5	1:6.4

If the number of caregivers in the three-year-old group is changed from three to two, the ratio for that *group* will decline from 1:5 to 1:7.5, a decrease of 33 percent. The *center-level* ratio, however, will decline by only 15 percent (from 1:6.4 to 1:7.5). The resulting change in the center's cost per child will be related to this 15 percent decline in the center-level ratio rather than to the substantially larger decline in the ratio of the three-year-old group. NDCS cost analyses were therefore conducted at the center level, using the ratio of caregiver hours to child hours for all caregivers and children at the center.

Taken by itself, the center-level caregiver/child ratio has the most substantial impact on cost per child of any single factor studied. As illustrated by Figure 7.2, even small changes in the caregiver/child ratio can have a large impact on costs. For example, the average NDCS center had one caregiver for every 5.7 children and had an

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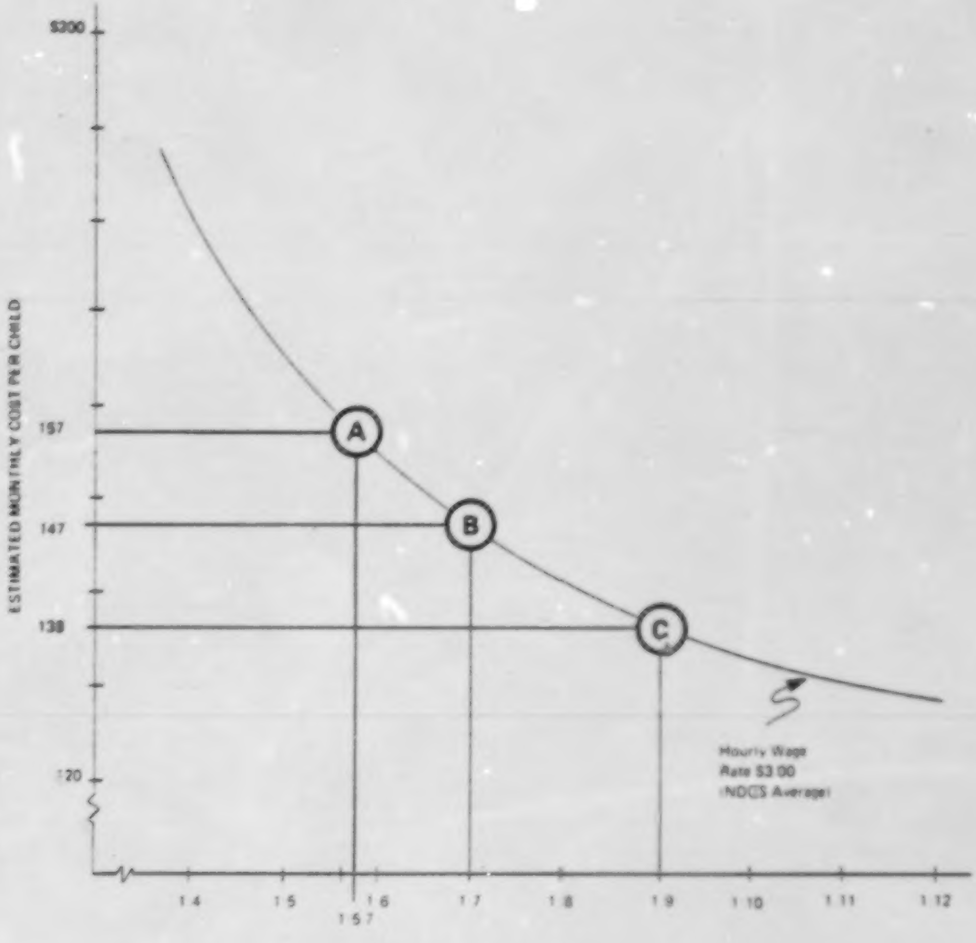
* A discussion of alternative measures of caregiver/child ratio and their implications for monitoring compliance with the FIDCR ratio requirements is contained both in Chapter Eight and Part Two of Appendix A.

Figure 7.2 The Impact of Staff/Child Ratio on Monthly Cost Per FTE Child (1976 Dollars)



[a] Enrollment basis adjusted for absenteeism.

average monthly cost per child of $157 (point A.)* At a center-level ratio of 1:7, the average cost per child in these centers would decrease to $147 per month (point B), whereas at a center-level ratio of 1:9 the average cost per child would decrease to $138 per month (point C).

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* 1976 dollars.

Noncaregiving Staff

Noncaregiving staff include directors and other administrative staff, as well as staff (e.g., nurses or social workers) who provide supplemental services to children and families. The number of noncaregivers working in a center has a significant impact on per-child costs. Estimates from the NDCS cost model indicate that when caregiver/child ratio and other relevant factors are held constant, each additional noncaregiver working in a center adds about $5 to the average center's monthly cost per child.[*]

Although the number of noncaregivers is significantly related to cost, the NDCS cost model was unable to establish a link between the provision of specific supplemental services and cost per child. In large part this was due to the extensive variation observed in the provision of supplemental services among the NDCS centers. Not only was there variation in the provision of specific services, but there was considerable variation in the "packages" of services provided – different centers made available different arrays of services to children and their families.

The diversity of services provided and the small sample size precluded estimating the relationship between the use of noncaregivers and the provision of individual services. However, evidence available from the Supply Study indicates that centers which provide physical and dental examinations to children and centers which provide assistance to parents in obtaining financial aid employ significantly more noncaregivers than other centers. Centers which provide physical and/or dental examinations are significantly more likely to have a nurse on staff; centers which provide assistance to parents in obtaining financial aid are significantly more likely to have a social worker on staff.[**]

Caregiver Qualifications and Wage Rates

The NDCS cost model examined the effects of caregiver qualifications on center costs through their effects on caregiver wage rates. The average wage rate paid by a center has a significant effect on center costs. A large part of the variation in wage rates is accounted for by factors other than variations in caregiver qualifications. For example, caregivers that work on a full-time basis receive, on average, significantly higher wages than do part-time employees. In addition, wages are substantially lower in parent-fee centers than in publicly funded centers even when staff qualifications are held constant.

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[*] Noncaregivers have been recorded on a head-count basis and figures *do not* reflect actual hours worked.

[**] While there is a significant relationship between the provision of these services and the presence of a staff specialist (e.g., a nurse or social worker), these services can be provided *without* having a specialist on the center's staff. Some centers contract with other agencies or individuals to provide these services (particularly in the case of health services). In addition, it is often the case that the center directors will provide social services to families (e.g., provide assistance in obtaining financial aid). Evidence from the Supply Study model indicates that publicly funded centers are more likely to provide these services than other centers, even in the absence of a staff specialist.[8]

Caregiver qualifications have some impact on wage rates but this impact appears to vary across qualifications categories. Wages are slightly higher for staff members with more formal education and longer tenure in their current center. Teachers tend to have more education and experience than aides; moreover, as expected, wage rates for teachers are higher than those for aides *even after adjusting for differences in education and experience.* As a result, average wage rates tend to be relatively higher where the ratio of teachers to aides is high. Education/training in a child-related area is positively associated with higher wage rates although the relationship appears to be very weak (that is, rarely statistically significant). A caregiver's day care work experience prior to beginning work at the current center was not significantly related to the wage rate received.

From a practical standpoint, variations in caregiver qualifications have a quantitatively small impact on cost per child. For example, caregivers in the NDCS centers had, on average, 13.5 years of formal education and received an average wage rate of $3.00 per hour (excluding fringe benefits). If the average educational attainment of caregivers were raised to 16 years (the equivalent of a college education), the average wage rate would increase to an estimated $3.06 per hour. It is clear that this increase would have an extremely small impact on cost per child. Similar results obtain for caregivers' day care experience.

It should be emphasized, however, that day care salaries in general are extremely low. Although nationally only 9 percent of caregivers earned less than the federal minimum hourly wage,* nearly two out of three caregivers' annualized earnings fell below the poverty line for a family of four (see Figure 7.3). Less than 10 percent of caregivers could earn enough working full time to support a family on a low-income budget.** As measured by the U.S. Department of Labor, the average annual budget of a "low-income" urban family of four in the U.S. is over $10,000.[11]

The cost of raising caregivers' wages to a more livable level would be substantial. For example, in Figure 7.4, it can be seen that at an hourly wage rate of $4.81 – barely enough to maintain the Department of Labor's low-income budget – the average cost per child in NDCS centers would increase from $157 (point A) to

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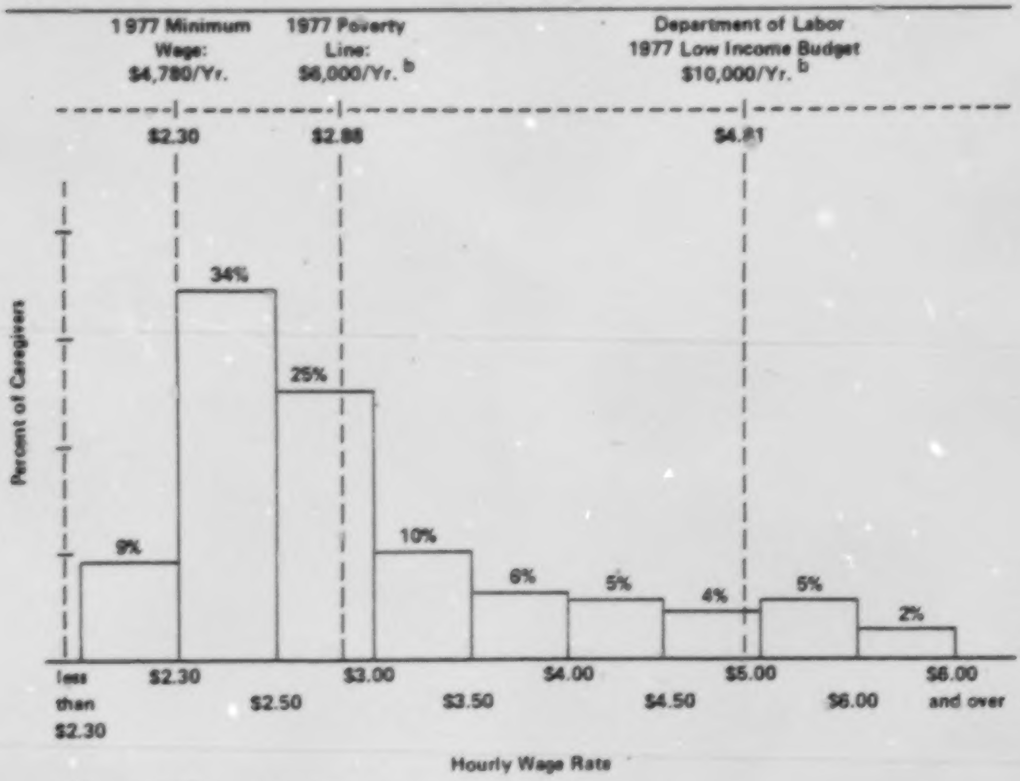
* These data are from the on-site survey of the NDCS Supply Study. At the time of this survey (March 1977) the federal minimum wage rate was $2.30 per hour.[9]

** Thirty percent of caregivers are the sole source of income for their families, and 69 percent provide more than half of their family's income.[10]

Figure 7.3 Distribution of Caregiver Wage Rates, 1977 [a]

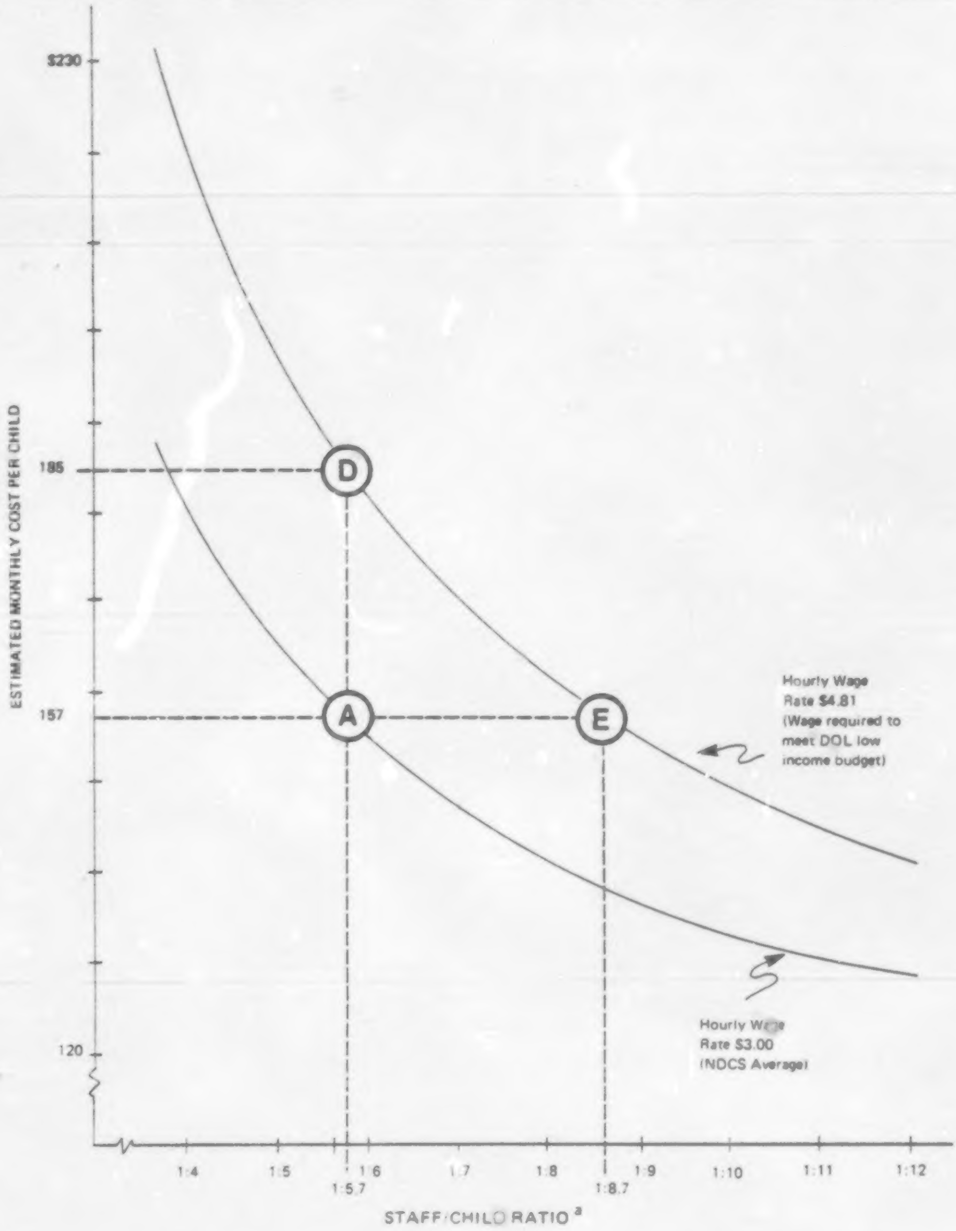


[a] Source: NDCS Supply Study Data

[b] For a family of four.

$185 per month (point D) if the current center-level ratio (1:5.7) were maintained. Centers could, of course, trade off higher wage rates for other aspects of their programs. For example, by decreasing observed ratios from 1:5.7 to 1:8.7 (point E), centers could increase wage rates to $4.81 per hour (the wage needed to achieve the DOL Low Income Budget for a family of four) without increasing the average cost per child. Or, holding wage rates at $3.00 per hour, the same reduction in ratio could fund some 7300 additional FTE children per $100 million expended per year. Alternative trade-offs of ratio, wages and number of children served are displayed in Table 7.7. Although the federal and state governments cannot, beyond minimum wage laws, set caregiver wage rates *directly* states can affect wage rates indirectly by setting or promoting reimbursement rates which, in conjunction with the ratio requirements, could permit centers to pay caregivers a more livable wage.

Figure 7.4 The Impact of Staff/Child Ratio and Wage Rates on Monthly Cost Per FTE Child (1976 Dollars)



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[a] Enrollment basis adjusted for absenteeism

Table 7.7: Illustrative Trade-Off Analysis[a] – Ratio vs. Wage Rate vs. Number of Children Served for Each $100 Million Expended (estimated in 1976 dollars)

	Center-Level Ratio[b]	Caregiver Wage Rate	Number of Children Served	Result
Current Practice in NDCS Centers	1:5.7	$ 3.00	53,100	N/A
Alternatives				
V	1:8.7	4.81	53,100	Lower [illegible] Higher W[illegible] Same Ch[illegible]
W	1:7	3.90	53,100	Lower Ratio Higher Wages Same Children
X	1:5.7	4.81	45,000	Same Ratio Higher Wages Fewer Children
Y	1:8.7	3.00	60,400	Lower Ratio Same Wages More Children
Z	1:7	3.50	54,000	Lower Ratio Higher Wages More Children

[a] NDCS data are used here only to illustrate critical trade-offs among three important dimensions – ratio, caregiver wage rates and number of children served per $100 million in public expenditures.

[b] Enrolled ratios adjusted for absenteeism.

Group Size

Cost per child is not significantly affected by variations in group size per se – as long as staff/child ratio, wages paid to classroom staff and the teacher/aide composition of classroom staff remain unchanged. For example, if centers add children to groups without increasing the number of caregivers, cost per child falls, but only because staff/child ratio has changed, not because of the addition of children to the group. If caregivers were also added, keeping ratio constant, cost per child would remain the same. Similarly, if centers with large groups use a single teacher and several lower-paid aides to supervise each group, cost per child is lower than in centers that maintain smaller groups, each supervised by a single teacher or by a teacher and only one aide. However, costs differ only because average wage rates differ across the two types of centers because of the different mixes of teachers and aides. If the teacher/aide mix did not differ, or if teachers and aides were paid the same wage, group size itself would not affect costs.

In practice, it may not be possible for a center to hold these other factors constant as it changes the size of its groups. Evidence from the Supply Study indicates that, on the average, caregivers receive higher wages for supervising larger groups of children. However, the magnitude of salary differentials is quite small – the difference in average salaries between centers with an average group size of 10 children and centers with an average group size of 20 children is less than $0.10 per hour.

Supply Study data also indicate that as group size is decreased, centers increase the *number* of groups used. This results in an increase in the number of staff employed by the center, and also increases the center's occupancy cost.* But again, the magnitude of these changes appears to be quite small. For example, cost per child in a 60-child center organized into four groups of 15 children would be an estimated $1.35 per month higher than if the same center were organized into three groups of 20 children (assuming that other factors remained unchanged).

RELATING COSTS, CENTER TYPES AND PROGRAM CHARACTERISTICS

As stated earlier, the monthly resource cost in the study's parent-fee centers was $46 lower than that in publicly funded centers ($130 vs. $176). It was also shown that, on the average, parent-fee centers:

- maintained lower caregiver/child ratios;
- utilized fewer noncaregivers;
- paid lower wage rates; and
- provided supplemental services with far less frequency.

Estimates derived from the NDCS cost model indicate that $22 of the difference in resources cost per child across center types may be explained in terms of differences in caregiver/child ratio, wage rates and the use of noncaregivers. While the NDCS cost model was unable to estimate the cost associated with specific supplemental services, it is clear that a major part of the remaining difference in cost ($24) is attributable to the cost of providing health and social services to children and families (e.g., contract services for physical examinations, related transportation).

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* Occupancy costs may increase if centers erect walls or partitions as the number of groups increases. While the initial capital outlay may be large, the cost of such capital improvements should properly be amortized over time. As such the change in *current* cost per child would be quite small. For example, a $5,000 capital improvement amortized over 10 years would increase the monthly cost per child in a 60-child center by only $0.70.

In addition to the provision of supplemental services, part of the remaining cost differential *may* be attributable to differences in administrative cost. Although no data are available on administrative cost for the NDCS centers,* day care providers have generally argued that serving subsidized children increases the cost of administration. As indicated above, parent-fee centers derived only 15 percent of their income from government reimbursements whereas the study's publicly funded centers received an average of 69 percent of their income from government reimbursements.

SIMULATION OF THE IMPACT OF ALTERNATIVE GROUP COMPOSITION REQUIREMENTS

The discussion to this point has focused on the relationship between center costs and program characteristics. For the most part individual program characteristics were treated in isolation. For example, in estimating the cost impact of changing caregiver/child ratio, it was assumed that centers *would not at the same time change other programmatic elements* such as caregiver qualifications or services provided.

In fact, centers make decisions regarding the various aspects of program content not in isolation, but in relation to one another and in relation to the market for day care services. Faced with a market demand for day care services, centers must determine the number of children they intend to serve and the fees they intend to charge. Decisions must also be made regarding the number (and type) of caregivers and noncaregivers to be used, salaries to be paid, services to be provided, and so on. These decisions are not made in a vacuum – all centers must satisfy the relevant state licensing requirements, and centers seeking to serve federally subsidized children must also satisfy the FIDCR. Clearly these decisions are interrelated. For example, staffing decisions directly affect a center's fee structure, which may affect the utilization of the center by nonsubsidized families.

In order to estimate the potential impact of changes in federal day care requirements, the interdependency of decisions made by centers regarding the various program elements must be taken into account as must the interdependencies that exist between day care centers and the market. Although the NDCS centers are, in general, representative of day care centers nationally, the Phase III NDCS centers constitute too small a sample to model the *simultaneous* changes in center characteristics that are likely to result from changes in government regulations.

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* Administrative costs were included with other personnel costs in the RCAS and are not separately identifiable. Time-use estimates would have been needed on an ongoing basis to allocate personnel costs across functional categories.

Data from the Supply Study were used to mathematically estimate the behavioral responses of day care centers to changes in government regulations and changes in the market for day care services.* The Supply Study model was used to forecast the changes in center characteristics which would be likely to occur as a result of changes in government day care regulations – changes similar to the variations which exist presently among the 50 states. The equations of the Supply Study model link policy and administrative decisions, on the one hand, and changes in the characteristics and cost of center care on the other hand. Combined with NDCS findings on effects of variations in center characteristics on the safety and development of children, this financial model provides a basis for cost-effectiveness analysis.

In summarizing the simulation results it is important to note that although the Supply Study model addresses a broad range of policy alternatives including changes in monitoring practices (e.g., the frequency of monitoring visits) and changes in reimbursement rates and practices, the NDCS simulation analysis focused primarily upon the impact of alternative policies for regulating classroom composition – caregiver/child ratio requirements and group size limitations – for preschool children in centers serving federally subsidized children.

In all of the simulation analyses it has been assumed that centers serving subsidized children will continue to serve such children, and that the number of subsidized children served by a center remains unchanged. It is also assumed that the future behavior of centers and consumers can be predicted by examining centers' current responses to differences in market conditions and regulations; that is, that centers and consumers will behave in the future much as they do today.

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* The Supply Study model is a statistical representation of the many individual decisions made by providers and consumers of day care services. The model consists of a set of interconnected behavioral equations; that is, mathematical formulations of existing day care center dynamics. Each equation shows the relationship between an important center characteristic, such as the policy variables – staff/child ratio, group size and staff qualifications – and a set of cost variables, such as wages paid to staff, cost per child, fees charged to parents and welfare departments. The model explores (predicts) the relationship between each variable and other variables by entering them both to explain (independent variable) and to be explained (dependent variable). The equations in the model are interconnected, then, in the sense that an independent variable in one equation is a dependent variable in another. In this way, a change in government policy which affects one variable directly (e.g., ratio requirements affecting the number of caregivers employed) will also indirectly have an effect on other variables. A technical monograph on the Supply Study econometric model will be found in Volume IV-C.[12]

In considering the potential impact of alternative group composition regulations for preschool children, several points emerge from the simulation analyses.

- Centers *do not* change the *types* of caregivers utilized in response to changes in staffing requirements – on average, the educational attainment and experience of caregivers are unaffected by staffing changes which result from changes in the staffing requirements.
- The provision of supplemental services (e.g., physical and dental examinations) is insensitive to changes in staffing requirements. That is, centers do not trade off supplemental services for increases in caregiver/child ratios.
- Changes in *actual* staffing patterns do not fully reflect changes in staffing requirements. For example, because centers typically have more staff than needed to meet requirements, a 10 percent decrease in the federal staffing requirements is likely to result in less than a 10 percent decline in the number of FTE caregivers utilized by the average federally subsidized center.
- The degree to which actual staffing patterns conform to the staffing requirements is very much dependent upon the extent to which the regulations are enforced. Under all of the alternative regulations examined, some federally subsidized centers will have insufficient staff to comply with the staffing requirements while others will have staff in excess of the requirements *if current enforcement practices remain unchanged.* A policy of strict enforcement is needed to eliminate undercompliance.
- Changes in cost per child will largely reflect changes in staffing patterns, and are therefore dependent upon the extent to which the regulations are enforced.

The fact that staffing patterns and center costs are related not only to the regulations themselves, but also to the degree of enforcement is often overlooked in discussion of alternative regulations. This point and the general results of the classroom composition simulations are used in estimating the impact of recommended classroom composition policies in Chapter Eight.

CHAPTER EIGHT: IMPLICATIONS FOR REGULATIONS AND ADMINISTRATIVE PRACTICES

Earlier chapters in this report focus primarily on the impact of variations in day care center characteristics on the welfare and development of children and on the cost of day care services. Chapter Six concludes that small group sizes, specialized training of classroom staff and, to a much lesser extent, higher staff/child ratios are associated with good classroom process, positive caregiver and child behavior and accelerated gains on tests predictive of children's later school achievement. Chapter Seven concludes that day care cost is strongly influenced by staff/child ratio but only marginally affected by variations in group size and caregiver qualifications.

This chapter uses the conclusions presented earlier to discuss the implications of the National Day Care Study (NDCS) for future federal day care regulations and administrative practices. Although they do not always appear explicitly in the discussion, the following general criteria have been applied in considering the appropriateness of alternative policies and practices.

- First and most important, what effect is a particular alternative likely to have on the well-being and development of children?
- Second, what will be the impact on day care cost and thereby on the number of children that can be served for a given level of government day care appropriations?
- Finally, is the policy realistic and feasible? That is, can it be implemented at reasonable administrative cost and without creating serious dislocations in the day care market?

Federal day care regulations are designed to protect the welfare and promote the development of the children receiving direct government day care subsidies – not to minimize cost or reduce administrative burden. Consequently, the first criterion listed above is paramount in evaluating alternative regulatory policies and the administrative practices adopted to implement those policies.

Evaluation of the regulatory implications of the NDCS is complicated by an inherent limitation of policy-related research. Statistical techniques can test hypotheses about whether a particular center characteristic has an impact on child outcomes or day care cost and can estimate how large an impact can be expected. Unfortunately, the results of statistical analyses alone cannot determine what particular values of group size, caregiver qualifications and staff/child ratio are optimal. For most center characteristics, a change which improves outcomes for individual children may increase cost and/or have various impacts on the day care market which are undesirable. Research staff are no better qualified than others to determine the precise point at which additional gains for children are more than offset by increases in cost (reduction in number of children served) or by market dislocations. In such circumstances, the researcher's responsibility is to inform policymakers of the type and degree of trade-offs that are involved in selecting one policy alternative over others that are realistically available.

A second complicating factor is that changes in regulations and changes in center characteristics are not necessarily commensurate. A change in the staff/child ratio requirements in the current FIDCR by 40 percent, for example, might result in a much smaller or much larger change in actual staff/child ratios. The magnitude of changes in actual ratios will depend on a variety of factors – present staff/child ratios, the attitudes of parents and providers as to the appropriateness of prevailing ratios, the strictness of government monitoring and enforcement and the degree to which government reimbursement rates are changed in accordance with the new requirements. Most of the discussion in Chapters Six and Seven above addresses the sensitivity of child outcomes and day care costs to variations in actual center characteristics. Before the conclusions presented earlier can be used to evaluate the implications of changes in regulations, however, a relationship must be established between regulatory changes and actual center behavior.

This chapter contains few recommendations that identify specific policies or practices as ideal – that is, as clearly superior to all other alternatives for dealing with a given regulatory or administrative issue. The chapter does, however, attempt to rule out for future consideration policies and practices that are clearly inferior. In these instances the three criteria listed above have been used to screen out certain options. Narrowing the list of options for future consideration is valuable in itself. Additionally, narrowing limits the number of alternatives for which issues of quality, cost, market dislocations and administrative feasibility must be discussed.

In the discussion of regulations pertaining to classroom composition – group size and staff/child ratio – following immediately below, one of the first issues discussed is the degree to which the number of policy options for future consideration can be limited to relatively few. Only after this screening process is completed are trade-offs between quality and cost and market implications fully discussed. Staff/child ratio and group size requirements for children under three years of age are discussed only briefly. The remainder of the chapter deals with regulatory policy with regard to caregiver qualifications and other center characteristics, monitoring guidelines for implementing new regulations and issues pertaining to ratesetting and current mechanisms for allocating government funds for day care services.

CLASSROOM COMPOSITION

The two basic dimensions of classroom composition are number of caregivers and number of children.* In day care regulations, however, classroom composition is generally defined in terms of group size (number of children) and staff/child ratio. As discussed in Chapter Four, setting the group size and ratio of staff to children automatically determines the number of adults. NDCS results are discussed below in terms of group size and staff/child ratio because research findings are most easily discussed in terms of those two variables and because they are generally used in regulatory language.

Staff/child ratio and group size have been the central issues in the continuing debate over the appropriateness of the Federal Interagency Day Care Requirements (FIDCR). The FIDCR are most stringent – and the requirements most specific and measurable – in the area of classroom composition. Because staff/child ratio and group size were thought to be critical determinants of the quality of day care and because staff/child ratio was known to be a major determinant of cost, this debate has centered on the trade-offs between quality and cost that are inherent in alternative ratio and group size requirements.

Current Regulatory Policy

The FIDCR set outer bounds on both group size and staff/child ratio. As indicated in Table 8.1, these limits are differentiated by age of child. The younger the child, the more stringent the ratio and group size requirements that apply.

Current federal policy appears to place far more emphasis on staff/child ratio than on group size. No group size requirements at all are currently specified for children under three years of age. In addition, the current federal guidelines for monitoring compliance with the FIDCR make no mention of procedures for determining compliance with group size requirements.[2] In contrast, staff/child ratio requirements are specified for children of all ages, and suggested monitoring procedures have been developed and circulated to state day care agencies.

Compared to provisions in state day care licensing regulations, the staff/child ratio provisions of the FIDCR are relatively stringent for children under six years of age. For younger children, the FIDCR require more than twice the number of classroom staff than is required by the average state licensing code. For children six years and older, the FIDCR ratio requirements are about equivalent to

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* Recommendations for classroom composition regulations for children under three years of age are discussed separately on pages 000 below.

Table 8.1: Group Size and Staff/Child Ratio Requirements

		Maximum Children per Staff Person	
Age of Child	Maximum Group Size: FIDCR[a]	FIDCR[a]	Average State Regulation[b]
Under Three Years	no limit specified	4[c]	8.4
Three Years	15	5	11.4
Four Years	20	7	13.7
Five Years	20	7	16.5
Six to Ten Years	25	15	18.8
Ten to Fourteen Years	25	20	19.6
Age Weighted Average	19.3[d]	6.4[e]	12.5[e]

[a] FIDCR, as revised by Title XX.

[b] *Supply Study*[1]

[c] Ratio of 1:1 required for children under six weeks.

[d] Derived by weighting age-specific requirements for children over three years of age by the number of full-time-equivalent children currently enrolled in U.S. centers in each age category. Applies only to the over-three-year age groups.

[e] Derived by weighting age-specific requirements by the number of full-time-equivalent children currently enrolled in U.S. publicly subsidized centers in each age category. Applies to all age groups.

state licensing standards. Since 86 percent of the children enrolled in centers are under six years of age, however, the relatively strict FIDCR standards for young children predominate. Across all ages of children in the average center, the FIDCR allow no more than 6.4 children per adult – half the 12.5 children per adult allowed by the average state licensing code.

Regulatory Options for Preschool Children

The results that have emerged from the NDCS suggest that federal day care regulations pertaining to classroom composition can be improved in several ways. It is not possible on the basis of NDCS results to identify a single policy that is optimal. It is possible, however, to recommend a set of specific changes which would significantly improve the regulations currently in effect.* Five classroom composition recommendations for preschool children are presented and discussed in this section:

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* There is currently a moratorium on federal enforcement of FIDCR staff child ratio requirements for children between six weeks and six years of age. During the moratorium, ratios have not been allowed to fall below levels prevailing at the end of 1975.

- **Staff/Child Ratio Recommendations:**
  - *The same staff/child ratio and group size regulations should be applied to three-year-olds as are applied to four- and five-year-olds.*
  - *The staff/child ratio requirement for three-, four- and five-year-old children should be no more stringent than 1:7.*
- **Group Size Recommendations:**
  - *The group size requirement for three-, four- and five-year-old children should be no more lenient than 18 children per group.*
  - *The group size limit should be twice the maximum number of children allowed per adult by the staff/child ratio requirement.*
- **Recommended Classroom Composition Policy Options:**[*]
  - *The alternative preschool staff/child ratio and group size requirements which should be considered for future regulations are limited to three basic policies.*

    Policy A: Group size shall be less than or equal to 14 children and staff/child ratio shall equal or exceed 1:7.

    Policy B: Group size shall be less than or equal to 16 children and staff/child ratio shall equal or exceed 1:8.

    Policy C: Group size shall be less than or equal to 18 children and staff/child ratio shall equal or exceed 1:9.

Each recommendation is discussed below.

- RECOMMENDATION: **The same staff/child ratio and group size regulations should be applied to three-year-olds as are applied to four- and five-year-olds.** The ratio and group size requirements for three-year-olds in current regulations are different than the requirements for four- and five-year-olds. In new regulations, this differentiation should be eliminated.

NDCS results provide no support for differentiation of requirements between three-year-olds and four- or five-year-olds. Statistical analyses indicate that variations in group size and ratio have the same effect on child behavior and test score gains for three-year-olds as for four- and five-year-olds.[**] Age differentiation in group size and ratio standards complicates monitoring and enforcement of the FIDCR. In addition, more stringent standards for three-year-olds than for four- and five-year-olds would suggest that government day care reimbursement rates should be higher for three-year-olds than for older children. Thus, regulatory monitoring, reimbursement rate-setting and scheduling of staff and preschool children by center directors would be simplified, without any significant loss in quality of care, through the adoption of more age-homogeneous group size and ratio requirements.

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[*] Numerical values of ratio and group size presented here are defined in terms of average attendance. If regulations are written in terms of scheduled enrollment, as recommended later in this chapter, different numerical values would be used. See discussion below (pp. 000).

[**] Because of variations in state kindergarten practices the NDCS research sample included only younger five-year-olds.

• **RECOMMENDATION: The staff/child ratio requirement for three-, four- and five-year-old children should be no more stringent than** 1:7. The current FIDCR limit for four- and five-year-olds is 1:7, but a limit of 1:5 is currently imposed for three-year-olds. A limit no stricter than 1:7 should be applied to all three age groups. Since the FIDCR specify ratio limits in terms of *normal*[*] staff/child ratios, a 1:7 requirement would permit as many as eight children per adult when no children are absent.[**] Stated in terms of scheduled enrollment rather than average attendance, the recommendation above would preclude requirements more stringent than one caregiver for every eight enrolled preschool children.

Variations in staff/child ratios of two or three children per adult do not significantly affect the quality of the day care experience for three-, four- and five-year-old children. In Phase III of the NDCS, staff/child ratios were manipulated in two separate experiments to test the impact of ratio changes.[§] In those centers in which ratios were experimentally decreased or increased by two or three children, caregiver and child behavior did not change as staff/child ratios were changed. In addition, there were no significant changes in test score gains of children in either experiment.

Larger variations in staff/child ratio *were* associated with variations in caregiver and child behavior. The NDCS sample as a whole had a much greater ratio variation (from below 1:5 to above 1:10) than the two Phase III experiments. In the full sample, small, but potentially important (though sometimes inconsistent) relationships between ratio and caregiver and child behavior could be discerned across this large range. For example (as discussed in Chapter Six) children in high ratio classrooms showed more interest/participation and task persistence. For caregivers, when ratios were high, there was a tendency toward less management behavior and toward more time spent interacting with other caregivers and doing center-related activities. Again, no differences in child test scores were found.

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[*] The use of this term in the FIDCR has generally been interpreted to mean that ratios should be calculated on the basis of average attendance rather than enrollment. Current Administration for Public Services monitoring guidelines state that child absences should be taken into account in determination of compliance.

[**] Since the average absence rate is 12 percent, average attendance would be seven children in a classroom with eight children enrolled (0.88 x 8 = 7.04).

[§] In one-third of the 49 NDCS centers ratios were experimentally increased, from an average of 1:9.2 to an average of 1:5.9. In each of the eight Atlanta Public Schools centers, ratios were allowed to decrease naturally (the school system was lowering ratio in all classrooms that year) in at least one classroom to an average of 1:7.4, while, at the NDCS' request, the school system agreed to maintain at least one classroom at the higher average of 1:5.4. In this second experiment, children were randomly assigned to a high or low ratio classroom. See Chapter Two above and Volumes II[3] and IV-C[4] of the NDCS Final Report for further discussion.

In summary, NDCS analyses demonstrate that *small* changes in staff/child ratio do not significantly affect the quality of the day care experience for preschool children. On the other hand, evidence from the total sample indicates that *large* reductions in ratio do have the potential for negatively affecting the preschool child's day care experience.

Variations in staff/child ratios do have a powerful influence on day care costs. A relaxation in the FIDCR ratio standard from 1:5 to 1:7 for three-year-olds would reduce the required number of full-time-equivalent (FTE) classroom staff currently in government subsidized day care centers by 4600 – a 9 percent reduction from the 51,200 FTE staff currently required for all ages of children.* Larger changes in the FIDCR ratio standard (e.g., to 1:9 for three-, four- and five-year-olds) would produce larger reductions in the number of required classroom staff. The savings realized by lowering staff/child ratios for children currently enrolled in government-subsidized centers could provide the funds to serve additional children for a given level of government day care appropriations.

The relatively small influence of staff/child ratio on classroom process and test score gains and the large impact on day care costs suggest relaxation of FIDCR ratio standards from current levels. Adoption of a 1:7 ratio limit for three-year-olds, consistent with current standards for four- and five-year-olds, would have a negligible impact on the quality of care (relative to current standards) and could allow a modest increase in subsidized enrollment. With a further relaxation of ratio standards, to 1:9 for example, a further increase in subsidized enrollment could be realized but cost savings would have to be balanced against potential changes in the quality of care and potential disruption of current day care practices.**

- **RECOMMENDATION: The group size requirement for three-, four- and five-year-old children should be no more lenient than 18 children per group.** The current FIDCR group size limits are 15 children per group for three-year-olds and 20 children per group for four- and five-year-olds. The average requirement for all three ages is about 18 children per group.* Since no monitoring guidelines have been developed for enforcement of group size requirements, it is not clear whether current requirements apply to scheduled group size or to average attendance. For consistency with recommendations on ratio requirements, the 18-child limit is intended here to apply to average attendance. In terms of scheduled group size, the 18-child limit would convert to 20 children per group.

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* Staff requirements have been calculated by multiplying age-specific ratio requirements by the number of FTE children currently enrolled, and then deflating the result by 12% to adjust for normal absences. All data, including the 12% estimate of the absence, are from the Supply Study.[5]

** Trade-offs inherent in choices among alternative ratio requirements are discussed later in this chapter.

NDCS results show that group size is strongly correlated with the effects of day care on preschool children. After examination of a broad spectrum of classroom process and school-readiness measures, the NDCS found consistent, statistically significant and developmentally meaningful impacts of group size. This finding is based not on a few scattered analyses, but on convergent results across the entire spectrum of outcome measures. Desirable caregiver and child behavior, frequent positive adult/child interactions and accelerated gains by children on tests predictive of school success were strongly and consistently associated with small group size.

Variations in group size of four to five children per group have a negligible impact on the per-child cost of center-based day care. NDCS cost analyses show that reductions in group size are associated with small increases in the ratio of paid to non-paid (volunteer) staff, the ratio of lead teachers to aides, and with small increases in occupancy costs. The effect of variations in group size on total operating cost is therefore quite minimal.

Imposing an upper limit of 18 children on group size of three-, four- and five-year-old children is entirely consistent with current center practices. For 90 percent of day care center classrooms containing three-, four- and five-year-olds, average group size (attendance basis) is less than or equal to 18 children. An 18-child FIDCR limit would therefore be exceeded in only 10 percent of existing preschool classrooms.

The relatively large influence of group size on classroom process and test score gains and the negligible impact on day care costs suggest that the FIDCR group size limit for three-, four- and five-year-old children be no more lenient than 18 children per group. Any changes to the current FIDCR group size requirement, therefore, would appropriately be in the direction of greater stringency, that is, toward smaller groups.

A reduction in the group size limit, to 14 children for example, is likely to improve classroom behavior and test score gains of children. In 23 percent of existing classrooms in subsidized centers some children would have to be reassigned to other classrooms or to new classrooms if a 14-child limit were adopted. Any cost increases and other market dislocations associated with classroom restructuring would have to be weighed against the additional gains for individual children. Trade-offs inherent in choosing among alternative group size requirements are discussed later in this section.

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* When the 15-child limit for three-year-olds and the 20-child limit for four- and five-year-olds are weighted by current enrollment in each age category the "average" requirement for all three ages is 18.4 children per group.

- **RECOMMENDATION: The group size limit should be twice the maximum number of children allowed per adult by the staff/child ratio requirement.** Group size and ratio requirements should not be set independently of one another. Both affect the range of adult/child configurations that centers can choose for individual classrooms. Sets of requirements such as 1:5 and 15 (multiple of 3) or 1:7 and 14 (multiple of 2) allow centers to arrange classrooms so that the group size limit and the ratio limit are met simultaneously.* For requirements such as 1:7 and 18 (multiple of 18/7, or 2.6) or 1:9 and 14 (multiple of 14/9, or 1.6) it is not possible to meet both the ratio and group size requirements simultaneously. When both limits cannot be simultaneously met, the group size and ratio requirements are inconsistent.**

The case of inconsistent regulations easiest to understand is one in which the group size limit is *more than twice and less than three times the allowable ratio of children to adults.* A group size limit of 18 and a ratio requirement of 1:7 represent such a case. Such a regulation applied to classrooms of 14, 15, 16, 17 and 18 children would place an effective limit on staff/child ratio of 1:7.0, 1:5.0, 1:5.3, 1:5.7 and 1:6.0, respectively. In effect, the only way a center could achieve a group size between 15 and 18 children is by increasing staff/child ratio significantly above the 1:7 limit set in regulations. An economic disincentive therefore exists against group sizes greater than twice the allowable ratio of children to adults. The only basis for the adoption of such regulations is if the government wanted to *allow* groups as large as 18 but wanted to discourage groups larger than 14. The danger with such a policy is that centers may ignore the more stringent (costly) ratio requirement, pay attention to the more lenient group size limit, and operate two-adult classrooms with 15 to 18 children. These centers would be out of compliance with the ratio requirement.

For day care center directors, responsible for arranging children and adults together in existing classroom space, the most difficult regulations to deal with are those that set group size limits at *less than twice the maximum allowable ratio of children to adults.*

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* A configuration of 3 adults and 15 children satisfies exactly a 1:5 ratio limit and a 15-child group size limit. Two adults and 14 children satisfies exactly a 1:7 ratio limit and a 14-child group size limit.

** For requirements of 1:7 and 18, the ratio limit can be reached only at group sizes of 7 or 14 children. The group size limit can be reached only in classrooms with three adults – a ratio of 1:6. For requirements of 1:9 and 14, the ratio limit can be reached only at a group size of 9; the group size limit can be attained if the ratio is 1:7.

Consider as an illustration regulations which limit staff/child ratio to 1:9 or above and limit group size to 14 children or fewer. With 42 children enrolled and a strong desire to limit cost, a center would operate five single-caregiver classrooms – two with one adult and nine children and three with one adult and eight children. A 42-child center with less flexible classroom space* would operate three classrooms – each with two adults and fourteen children. The difference in staff/child ratios – the lower, less costly 1:8.4 (5/42) versus the higher, more costly 1:7 (6/42) respectively – creates a strong incentive for centers to operate a large number of single caregiver classrooms or to ignore the group size requirement and operate out of compliance with a 2/17, 2/17 and 1/8 arrangement.

The larger the size of the center the more cumbersome this illustrative regulation becomes. A center with 72 children enrolled and attempting to comply with this regulation would face the following choices:

- *comply and minimize cost:* eight single-caregiver classrooms, each with one adult and nine children (ratio of 1:9);
- *comply and minimize space:* six multi-caregiver classrooms, each with two adults and 12 children (ratio of 1:6); or
- *violate group size limit of 14:* four multi-caregiver classrooms, each with two adults and 18 children (ratio of 1:9).

By examining the ratio and group size arrangements that centers would adopt across a broad spectrum of enrollment levels (e.g., 13 to 80 children), one can demonstrate that regulations of 1:9 for ratio and 14 for group size would confront most centers with an unappealing choice of: (1) setting up many single-caregiver classrooms; (2) creating fewer classrooms but operating with expensive ratios (relative to 1:9); or (3) violating the group size limit by placing 15, 16, 17 or 18 children in a room.[6]

On the other hand, group size/ratio multiples as low as 1.0 (e.g., limits of 1:12 and 12, or 1:10 and 10) can be ruled out on the basis of market-impact considerations. A group size limit of 12 children would place about half the classrooms containing three-, four- and/or five-year-old children in subsidized centers out of compliance. A group size limit of 10 children would increase the degree of noncompliance to 60 percent. Ratio limits as low as 1:12 or 1:10 could indeed reduce day care cost, were overcompliance eliminated by severe reductions in government day care reimbursement rates. However, existing classroom staff in subsidized centers would have to be reduced by 29 to 37 percent, or enrollment would have to increase by 41 to 59 percent,* before the cost savings could be fully realized. Finally, limits of 1:12 and 12 or 1:10 and 10 would effectively rule out multiple-caregiver classrooms – the predominant staffing pattern in U.S. centers. These potential market dislocations are so severe that such regulations do not merit serious consideration.

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* Only three classrooms, with no ability to subdivide these rooms by erecting partitions.

The illustrations used above are easily generalized. Anyone wishing to take the time can demonstrate that other sets of inconsistent ratio and group size requirements create similar incentives to violate one or the other of the two inconsistent components of the regulations. A ratio requirement of 1:8 and a group size limit of 18 is as troublesome as the 1:7 and 18 example above. Similarly a ratio requirement of 1:8 and a group size limit of 12 is as troublesome as the 1:9 and 14 example above. Of course, a ratio requirement of 1:8 and group limit of 15 would not create as serious a set of conflicting signals as a 1:9 and 14 requirement, for 15 is closer to twice an 8:1 allowable child-to-adult ratio than 14 is to twice a 9:1 ratio. The impact on the development and welfare of children is likely to be so little affected by a choice between 1:8 and 16 versus 1:8 and 15, however, that there appears to be little justification for adopting regulations with *any* small inconsistencies between ratio and group size limits.

The evidence therefore appears to be quite strong that, whatever ratio and group size regulations are adopted, the two components should be "consistent" – *the group size limit should be twice the maximum number of children allowed per adult by the staff/child ratio requirement.* This conclusion, combined with the earlier policy recommendations, is very useful in narrowing the set of alternative classroom composition regulations which should be considered in future discussions.

- **RECOMMENDATION: The alternative preschool staff/child ratio and group size requirements which should be considered for future regulations are limited to three basic policies.****

Policy A: *Group size shall be less than or equal to 14 children and staff/child ratio shall equal or exceed 1:7.*

Policy B: *Group size shall be less than or equal to 16 children and staff/child ratio shall equal or exceed 1:8.*

Policy C: *Group size shall be less than or equal to 18 children and staff/child ratio shall equal or exceed 1:9.*

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* Few existing centers have sufficient excess capacity to expand enrollment by 59 to 79 percent. For example, Supply Study results show a 12% maximum excess capacity for **FFP centers.** It is likely, therefore, *that the major impact* of substantial relaxation of ratio requirements would be to create pressures to reduce staff.

** As will be pointed out below in the section on "Monitoring Guidelines" (page 000), the quality and cost outcomes of each policy are dependent on how classroom composition is measured in the monitoring process.

For all three of these policies, ratio and group size are defined in terms of average attendance.*

Evaluation of the Three Classroom Composition Policy Options for Preschool Children

Making a choice among these three alternative classroom composition policies is not an easy task. Trade-offs are involved between the number of children served and the quality of care received by individual children. A number of other factors must be taken into consideration as well. Which policy will cause the most significant departure from current day care practices? How many centers not currently enrolling government subsidized children could satisfy alternative regulations and therefore be certified to provide subsidized day care? How would the degree of socioeconomic integration in subsidized centers be affected? Would day care centers in some states be more seriously affected than those in other states? Policymakers need information on these issues before they can make an informed choice and defend that choice against external pressures.

The discussion below focuses on the trade-offs involved in choosing among Policies A, B and C. As will be noted below, Policy A is the best policy from the perspective of quality of care for children but offers the least potential for reducing cost per child and, thereby, the least potential for serving more children from existing government day care appropriations. At the other end of the spectrum, Policy C is the least effective quality standard but offers the most potential for reductions in cost per child. Policy B represents the middle of the spectrum and for most choice criteria (e.g., quality, cost, market dislocation) produces results that are about half-way between those of Policy A and Policy C.

Quality of Care for Individual Children

Since day care regulations are designed to protect the welfare and promote the development of children, the implications of alternative regulations for day care quality are clearly the primary consideration in choosing among alternative policies. In Chapter Six above, the impact of variations in center characteristics on classroom behavior of children and adults and on test score gains of children was examined in detail. That information is used here to evaluate the quality implications of alternative regulations.

To be effective, a regulation must do a good job of separating desirable from undesirable consequences. Suppose that across all day care centers, some of which comply with a particular regulation and some of which do not comply, the average test score gain of children over a nine-month period is eight points. If the average gain score of children in centers that comply with a particular regulation is 12 points (50% above the average for all centers), then the regulation is effective. If similar, substantially above average results were obtained, applying the same regulation, across a broad range of outcome measures, the regulation would clearly represent an effective and consistent definition of good quality day care programs.

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* Converted to limits measured in terms of enrollment, Policy A (1:7 and 14, attendance basis) is equivalent to an enrollment-based ratio requirement of 1:8 and an enrollment-based group size limit of 16 children. Policy B converts to 1:9 and 18. Policy C is equivalent to 1:10 and 20.

Of the three options under consideration, Policy A is the best regulatory policy from the perspective of insuring the quality of day care programs for children. As shown in Figure 8.1, Policy A is associated with moderately and, in some cases, substantially above average results across a diverse set of measures of classroom process and test score gains.* Policy B is associated with small to moderate improvements in outcome measures. Policy C, however, is associated with outcomes that are generally about average for NDCS centers. Policy C is an effective regulation only in the sense that it protects children from the well below average results associated with centers having very large group sizes (above 18 children) and very low staff/child ratios (below 1:9), as shown by the "X" bar in Figure 8.1.

Policy A has the best impact on the classroom behavior of caregivers. Compared to the two more lenient alternatives, a group size limit of 14 and a ratio requirement of 1:7 are likely to increase very substantially the frequency of classroom staff participating in small subgroup activities (work with 7 or fewer children) for portions of time, rather than working constantly with all the children in the room. Policy A is also likely to increase the frequency of positive caregiver behaviors toward children (social interaction – praising, comforting, questioning, instructing; and subgroup interaction – the frequency of interaction with smaller activity groups) and reduce the frequency of neutral or negative behaviors (management – commanding, correcting; and observing – primarily passive monitoring of children).

Policy A has the best impact on classroom behavior of children. NDCS analyses suggest that more positive child behavior (reflection/innovation – considering, contemplating, experimenting, adding new toys or ideas to ongoing activities; and cooperation) should be observed among children in centers in compliance with Policy A than among children in centers in compliance with Policies B or C. Substantially less aimless wandering and noninvolvement in tasks should also be observed with Policy A.

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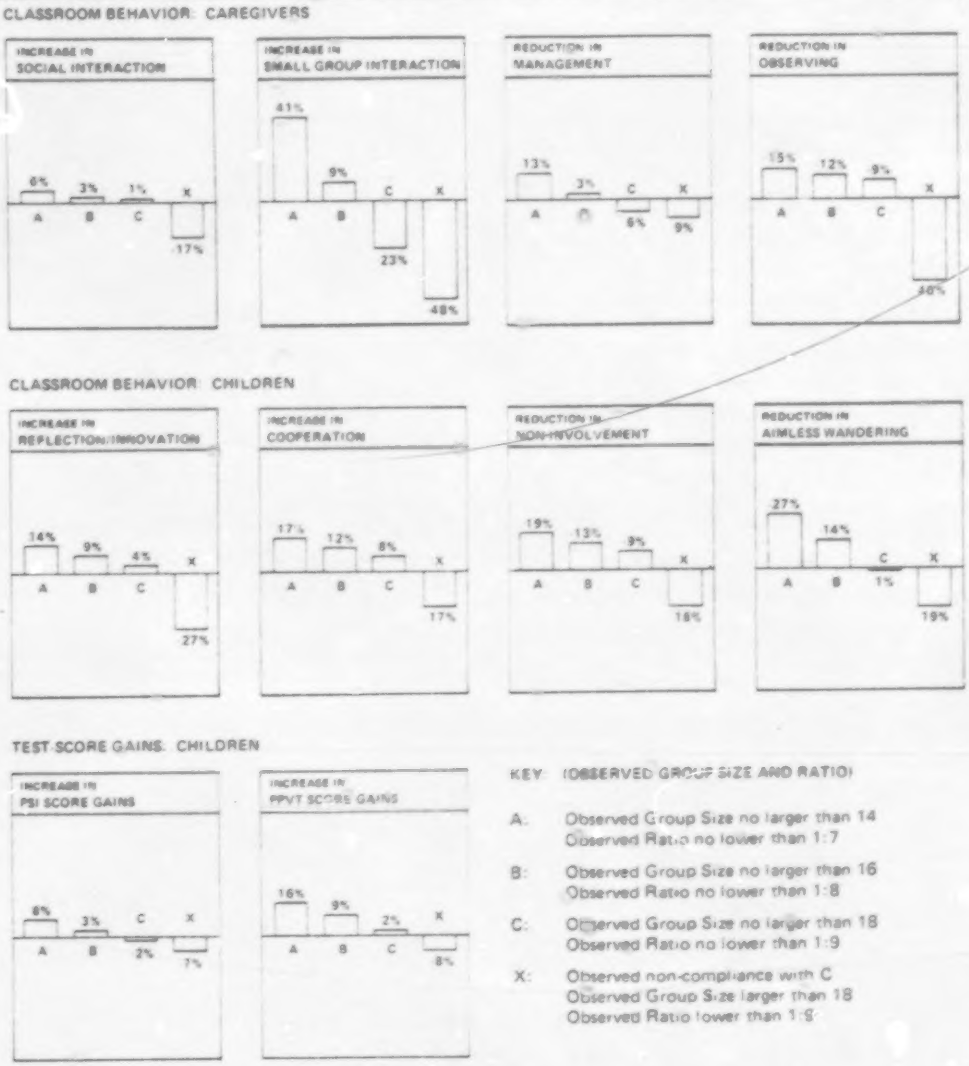
* The estimate of the impact of the three alternative policies on measures of quality presented are based on the assumption that the number of classroom staff in excess of the required minimum would be no greater than current practice.

Figure 8.1 Impact of Alternative Preschool Classroom Composition Policies on Caregiver and Child Behavior and Test Score Gains [a]
(Percentage Increase or Reduction from NDCS Average [b])



KEY: (OBSERVED GROUP SIZE AND RATIO)

A: Observed Group Size no larger than 14
Observed Ratio no lower than 1:7

B: Observed Group Size no larger than 16
Observed Ratio no lower than 1:8

C: Observed Group Size no larger than 18
Observed Ratio no lower than 1:9

X: Observed non-compliance with C
Observed Group Size larger than 18
Observed Ratio lower than 1:9

[a] Figure 8.1 is intended to illustrate the direction of relationships between each policy option and selected measures of quality as well as the consistency of the pattern of results that emerged across different outcome measures. Corrections for imperfect reliability of measures would have resulted in even larger effects than shown here.

[b] Program quality measures were determined with centers in *full compliance*, defined as (1) no centers that violate classroom composition regulatory minimums, (i.e., with groups too large and ratios too low) and, (2) no more than 12 to 15 percent (on average) more caregiving staff per center than the regulatory limit (A, B and C only).

Policy A has the strongest impact on test score gains of children. Analysis of children's scores on the Preschool Inventory and the Peabody Picture Vocabulary Test indicate that Policy A is associated with higher gain scores for children than the more lenient requirements embodied in Policies B and C. Policy B is associated with above average gain scores, but the estimated impact of Policy B is only about half that of Policy A. For Policy C, estimated gain scores are not significantly above the average for all NDCS centers but are noticeably above estimated results for centers with group sizes above 18 and staff/child ratios below 1:9.

None of the effects discussed above have been adjusted to correct for the less than perfect reliability of measures used for group size, staff/child ratio, behavioral outcomes and test gain scores.[*] Had such adjustments been deemed appropriate, most of the "measured" effects of alternative policies would be larger and even more strongly supportive of Policy A.

The conclusion that Policy A represents a considerably higher quality standard than Policy C, and moderately higher than B, is based on the consistency of results across many outcome measures. It is difficult to assess the importance of a 14 percent increase in reflective/innovative behavior on the part of children, when this result is viewed outside the context of other findings. Similarly, each of the other outcome estimates displayed in Figure 8.1 is less than conclusive when examined in isolation from other results. When a broad range of behaviors and test results all point to the same conclusion, however, it is much more difficult to question the soundness and practical significance of the research evidence.

Not only is Policy A a stronger quality standard than Policy B or C; it is also a stronger standard than the ratio and group size provisions in the current FIDCR. Although the ratio requirement in Policy A (1:7) is slightly more lenient than the current FIDCR ratio provisions,[**] the group size requirement in Policy A (14 children) is more stringent than the current FIDCR group size provision.[§] Since NDCS results have shown group size to be a more important correlate of quality than staff/child ratio, a strengthening of the current group size limit combined with a slight relaxation of the current ratio limit should have a net positive impact on day care quality. The superiority of Policy A relative to the current

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[*] A complex statistical procedure (the Lloyd-Porter correction) was considered for use in the NDCS but rejected on grounds of technical feasibility. Application of this technique would have increased estimated effects by a factor of two or three.

[**] The current FIDCR requirement of 1:5 for three-year-olds and 1:7 for four- and five-year-olds averages out to a 1:6.3 requirement when translated into a single ratio standard for all three age groups.

[§] The current FIDCR standards, 15 for three-year-olds and 20 for four- and five-year-olds, average out to an 18.4-child limit across the three age groups

FIDCR is important, for the FIDCR have long been promoted as a "high quality" standard – designed to promote the development of economically disadvantaged children.

Day Care Costs

In choosing among alternative regulatory policies, some consideration must be given to the effect of various options on the per-child cost of day care services. If an option that strongly promotes the development and protects the welfare of children also increases the cost of day care services, the selection of that option will reduce the number of children receiving subsidized day care for any given level of government day care appropriations. In such a case, improvements in the quality of services must be balanced against reductions in the quantity of services. Chapter Seven discussed the impact of variations in group size and staff/child ratio on day care cost. That information is useful in examining the cost implications of alternative regulations.

One of the components of the NDCS was the development of a computer simulation model of the changes in center characteristics which would result from changes in regulations. The most important simulation results were reported in Chapter Seven and are discussed below. Some of the results have direct bearing on the effect of alternative regulatory policy on actual center characteristics and on day care cost.

All three of the policy options under consideration will reduce cost per child below the level reflected in current government day care reimbursement rates. All three of the options impose more stringent group size standards than are imposed by the current FIDCR.* Since variations in group size have a very small effect on cost per child, however, changes in group size requirements are not important cost considerations. Far more important is the reduction in staff/child ratios permitted by the three options. The simulation model indicates that relaxation in ratio standards offers significant potential for cost reductions.

One of the major results of the computer simulation experiments is that the cost saving realized by relaxation of staff/child ratio requirements is heavily dependent upon how the new regulations are enforced. If more lenient requirements are adopted with no changes in current enforcement practices, savings in the range of 1 to 4 percent (Policy A), 6 to 9 percent (Policy B) or 10 to 13 percent (Policy C) are likely. If noncompliance is eliminated by strict enforcement, increases in cost per child will occur in undercomplying centers as ratios are increased to reach compliance. These increases will virtually offset the decreases in cost per child in other centers, which can reduce ratios without violating regulatory limits. The net result with strict monitoring would be a savings of only about 1 percent (Policy A), 2 percent (Policy B) or 3 percent (Policy C).

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* The 18-child limit on group size included in Policy C is only negligibly more stringent than the average requirement of 18.4 currently imposed for three-, four- and five-year-old children.

A major reason that the cost saving from relaxation of ratio requirements is not larger is that many centers operate at ratios above the minimum permitted by the FIDCR; that is they exhibit a pattern of *overcompliance.*[*] The staff/child ratio standards in the current FIDCR require, on average, center-level[**] staff/child ratios for all ages of children at or above 1:6.4 (cf. Table 8.1 above). The average actual ratio currently prevailing in subsidized centers is 1:5.9. Were more lenient ratio limits adopted, computer simulations indicate that centers would in fact reduce staff/child ratios by reducing classroom staff and by increasing enrollment, but would still maintain, in many instances, significantly more staff than regulatory minimums.

Substantial saving would be realized if these "excess" staff were reduced, either by expansions in enrollment, by natural attrition of classroom staff over time or by other changes in staffing arrangements. Regardless of how overcompliance is eliminated, the reductions in cost per child would be dramatic. As much as a 5 percent saving could be realized with the current FIDCR ratio limits. Under more lenient ratio requirements, potential saving could range from 12 percent (Policy A) to 17 percent (Policy B) or 21 percent (Policy C). These estimates reflect the reductions in cost per child from current levels which would result if *all* subsidized centers were in *exact* compliance with alternative ratio requirements. Because some degree of overcompliance is appropriate if ratio requirements are viewed as lower limits rather than exact targets, these estimates overstate probable cost saving by as much as one-third.[§]

Quality and Cost Trade-offs

In choosing among the three policy options recommended for consideration, a real and serious trade-off must be made between quality and cost. Policy A has been shown to be the best option from the perspective of promoting the development and protecting the welfare of individual children. Policy C, however, is the best option from the perspective of reducing cost per child and potentially increasing the number of children receiving subsidized day care services.

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[*] Reasons for overcompliance are likely to include the attitudes of parents and day care staff about appropriate levels of staff child ratio and the relatively strict FIDCR monitoring and enforcement practices adopted in some states.

[**] Center-level requirements are calculated by weighting age-specific requirements (e.g., requirement for three-year-olds) by enrollment in each age group.

[§] Some amount of overcompliance is unavoidable. It is often impossible for directors to compose all classrooms exactly at regulatory limits, because of space constraints, fluctuations in enrollment, changes in the age composition of enrollment, and so forth.

However, the reader is strongly warned against accepting too quickly the argument that Policy C will guarantee subsidized day care services for more children. At the present time most federal day care funding is authorized under Title XX of the Social Security Act. The particular funding mechanism used under Title XX lumps day care appropriations together with funds for a variety of other child-related services. Many states are currently operating at their allocated ceilings under Title XX. A risk exists, therefore, that a part or all of any cost saving realized for day care services in such states would be allocated to other social services. This risk should be considered carefully by those attracted to the "provide care for more children" argument.

Other Considerations

Aside from quality and cost, a number of other factors should be considered in choosing among the three policy options – consumer market tests, impact on existing day care practices, degree to which nonsubsidized centers could be certified to enroll subsidized children, impact on socioeconomic integration in subsidized centers and interstate differentials in impact. Most of these issues have been touched upon briefly in earlier discussion and will be examined below.

One type of evidence that is important in evaluating the relative merits of the three regulatory options is a market test – determination of the choices that parents make when their selection of day care programs is not controlled by government regulations and when they must pay the cost of day care out of family income. This evidence also supports the conclusion that Policy A is the stronger quality standard.

The degree of overcompliance on grouping and staffing arrangements in *nonsubsidized* centers indicates the level of care that parents are willing to buy. For example, the average ratio requirements imposed on nonsubsidized centers by state licensing codes is 1:12.5. The average actual ratio currently prevailing in nonsubsidized centers is 1:7.6. Almost 50 percent of nonsubsidized centers currently maintain center level staff/child ratios above 1:7. Similar high quality standards are evident with respect to group size. Group size in 73 percent of the preschool classrooms in nonsubsidized centers is at or below 14 children (91 percent at or below 18 children).

These facts suggest that staff/child ratios of 1:7 or above and group sizes of 14 or below are valuable to enough parents and staff in nonsubsidized centers to pass a market test for appropriateness in subsidized centers. If Policy C is adopted rather than Policy A, many subsidized day care centers will operate with ratios below and group sizes above those prevailing in one-half to three-quarters of the nonsubsidized market.* Only by adopting Policy A or B and encouraging systematic enforcement can the federal government ensure that subsidized care is at least as high in quality as that provided by the majority of nonsubsidized centers.

None of the three policy options would severely disrupt current staffing and enrollment practices in subsidized centers, but Policy C would require the fewest and smallest changes from the perspective of undercompliance.** That is, if strictly enforced, Policy C would require increases in staff/child ratios in only 17 percent of currently subsidized centers. Only 11 percent of the classrooms containing three-, four- and five-year-old children in those centers currently exceed an 18-child group size limit. On the other hand, Policy A would require ratio increases in only 28 percent of subsidized centers and group size reductions in only 23 percent of their classrooms of three- to five-year-old children. It is evident, therefore, that even the most stringent of the three policy options is consistent with current staffing and enrollment practices in a substantial majority of the centers which new regulations would affect.

A substantial number of nonsubsidized centers would satisfy any one of the three regulatory options and would therefore be immediately eligible for FIDCR certification. Almost half of nonsubsidized centers maintain staff/child ratios at or above the limits set by Policy A.§ The percentage would increase to about 63 percent if a ratio requirement of 1:9 were adopted. Since groups are smaller in nonsubsidized centers than in subsidized centers, the group size limits in the three policy options do not constitute a serious obstacle to FIDCR certification of nonsubsidized centers. Almost 73 percent of nonsubsidized centers currently satisfy a 14-child group size limit, and 91 percent satisfy an 18-child limit. Although the adoption of Policy C would increase the percentage of nonsubsidized centers that would immediately be eligible for certification, the percentage eligible for certification under Policy A is more than sufficient for even large increases in demand for subsidized day care slots.

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* Implicit here is the assumption that the day care reimbursement rates that are likely to accompany Policy C will discourage or preclude ratios above 1:7 and group sizes below 14.

** It should again be noted that all three policies may produce some degree of overcompliance, that is, centers will have more staff than needed to meet the requirement, beyond the average of 10 to 15 percent allowable overcompliance. Unless centers were given a reasonable period of time to adjust (by increasing enrollment or reducing staff through natural attrition) substantial staffing disruption could occur and would be most pronounced for Policy C.

§ Assuming no change in ratio requirements for children under three and over six years of age.

The impact of the three regulatory options on the degree of socioeconomic integration in subsidized centers will ultimately depend on how the policies are implemented at the state and local levels. Using any savings from relaxation of ratio requirements to pay for additional subsidized slots in already heavily subsidized centers would increase the isolation of poor children. It should be noted that concentration of subsidized children in as few centers as possible may well be attractive to state and local administrators because it could reduce the number of centers for which the FIDCR must be monitored, and thereby reduce monitoring cost. On the other hand, using the savings from ratio reductions to implement sliding fee schedules or to expand subsidies to nonsubsidized centers would increase state and local administrative cost but could substantially increase de facto socioeconomic integration.*

Policy C offers slightly more potential for a change in the socioeconomic mix of children in subsidized centers. Currently, only 24 percent of subsidized centers draw 90 percent or more of their enrollment from families with annual incomes below $6,000, and more than half serve some families with incomes above $15,000. This record, although not bad as it stands, can be improved if decreases in cost per child and resulting decreases in the fees charged for service attract more parent-fee children to subsidized centers. On the other hand, a shift to Policy C might lead to a situation in which welfare agencies placed even more children in the centers they currently use. Or, if reimbursement rates were lowered to be equal to or below fees that parents pay, some centers might choose not to continue serving welfare-eligible children. In either case, this could result in a decline in socioeconomic mix of children. Therefore, Policy C offers both the greatest opportunity for an improvement in socioeconomic mix and also presents the greatest danger for a decrease in integration.

Not all states will be affected equally by adoption of any one of the three policy options. States which currently enforce the FIDCR ratio provisions will realize small to moderate saving under any of the three options and will be able to expand subsidized day care to more families (or divert funds to other Title XX programs). Many states have not rigorously enforced FIDCR ratio standards in the past. These states may find that day care costs actually increase as a result of strict enforcement of new standards (as they would with strict enforcement of the 1968 FIDCR), but the quality of care for individual children should improve.

Table 8.2 indicates the diversity in prevailing staff/child ratios for the ten states with the largest number of subsidized centers.

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* Sliding fee schedules permit government subsidy of day care for lower middle-income families as well as for the low-income families now subsidized. Partial subsidy for lower middle-income families would permit these families to enroll their children in the higher cost centers serving fully subsidized children.

Texas and Michigan might save only a little were Policy C adopted, for average staff/child ratios in those states are currently close to Policy B. North Carolina, Pennsylvania, New York and New Jersey would realize substantial reductions in day care costs even under Policy A.* The remaining states on the list would realize savings only if Policy B or Policy C were adopted.

Table 8.2: Cross-State Comparisons of Staff/Child Ratios and Degree of Regulatory Compliance (Subsidized Day Care Centers Only)

State	Number of Subsidized Centers	Average Center-Level Staff/Child Ratio	Average State Ratio Requirement	Percent of Centers in Compliance with 1968 FIDCR Ratios
California	710	1:5.8	1:11.9	71
New York	540	1:5.1	1:6.3	86
Illinois	469	1:6.0	1:11.7	60
Oklahoma	398	1:6.0	1:10.8	57
North Carolina	374	1:4.4	1:13.3	91
Texas	329	1:7.3	1:15.7	51
Pennsylvania	301	1:4.9	1:9.6	85
Georgia	295	1:6.1	1:15.1	68
Michigan	265	1:7.6	1:12.2	38
New Jersey	255	1:5.2	1:7.6	80

Source: NDCS Supply Study[7]

The variability in the characteristics of subsidized day care centers across states reflects the serious inequity in the current uneven enforcement of federal day care regulations. If the federal government does not adopt a consistent, unambiguous and determined posture with respect to the objectives, content, interpretation and enforcement of federal regulations, these large variations in program characteristics across states will persist. Their elimination is probably as important to the equity of government day care policy as the nature of new federal standards for group size and staff/child ratio.

Because many issues have to be considered, the selection of one from among the three regulatory options is not an easy task. The impact of the three policies on quality, cost and the day care market is summarized in Table 8.3 No clear-cut, overall advantage is evident for any one of the three options. One important conclusion is evident, however. Aside from the cost impact likely to be felt in current low compliance states, Policy A is more cost-effective than the classroom composition provisions incorporated in the current FIDCR. Adoption of Policy A should not only decrease cost (allow more children to be served) but should also increase program quality. The problem that policymakers must confront, however, is that *further, non-negligible reducations in cost and expansion in subsidized services can be realized by moving from Policy A to Policy B or C, but only at the expense of reductions in program quality.*

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* New Jersey and especially New York have stringent staffing requirements in their state licensing codes which would limit the potential saving realized from FIDCR ratio reductions.

Regulatory Recommendations for Children Under Three

The NDCS conducted a small supplementary study of infant and toddler day care.[*] While much narrower in scope and purpose than the study of preschool center care, it provided adequate information on which to base two interrelated recommendations for infant/toddler classroom composition regulations.

- **RECOMMENDATION: Future federal regulations should maintain the currently required staff/child ratio for children under three years of age.**
- **RECOMMENDATION: Future federal regulations should incorporate, for children under three years of age, a group size requirement more stringent than the requirement for preschool children.**

The Title XX revised FIDCR currently require a minimum staff/child ratio of 1:4 for children under three years of age.[**] However, when this staff/child ratio requirement for infants and toddlers was incorporated into federal regulations by Title XX, no corresponding group size requirement was included. The earlier recommendation that the group size limit be an even multiple of the maximum number of children allowed per adult suggests that the corresponding group size limit for infants/toddlers be either 8 or 12 children per group, or 8 for infants up to 18 months old and 12 for toddlers up to 36 months old.

Based on evidence from the NDCS Infant/Toddler Study,[§] *group size is an important correlate of the classroom behavior of children under three and of the frequency and quality of their*

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[*] See Chapter Two, Appendix B and Volume IV-D of the NDCS Final Report.[8]

[**] A 1:1 ratio is required for children under six weeks of age.

[§] The NDCS Infant Toddler Study conducted classroom observations of children under 30 months and of the caregivers assigned to care for these children in a multi-site sample of 54 centers. Observations were of one-day duration in each center.

Table 8.3 Comparison of Estimated Quality, Cost and Market Implications of Alternative Preschool Classroom Composition Regulations [a]

Criterion	Policy A	Policy B	Policy C
PROGRAM QUALITY full compliance[b]			
Quantitative Indicators[c]			
Caregiver Behavior:	+ 6 to 41%	+ 3 to 12%	+ 1 to –9%
Child Behavior:	+14 to 27%	+ 9 to 14%	+ 9 to –1%
Child Test Score Gains.	+ 8 to 16%	+ 3 to 9%	+ 2 to –2%
Qualitative Summary (relative to FIDCR)	Moderately to Substantially Higher	Slightly to Moderately Higher	Same to Slightly Lower
PROGRAM COST SAVINGS[d]			
full compliance	6 - 9%	9 - 12%	13 - 16%
[- current monitoring practices:	[1 - 4%]	[6 - 9%]	[10 - 13%]
-elimination of under-compliance only]	[0 - 2%]	[1 - 3%]	[2 - 4%]
Potential Increase in Number of Children Served			
full compliance	7 - 10%	11 - 14%	16 - 19%
[-current monitoring practices;	[1 - 4%]	[7 - 10%]	[11 - 14%]
-elimination of under-compliance only]	[0 - 2%]	[1 - 3%]	[2 - 4%]
PERCENT SUBSIDIZED CENTERS INITIALLY IN COMPLIANCE:			
– with staff/child ratio	72%	79%	83%
– with group size	77%	84%	89%
CERTIFICATION OF NON-SUBSIDIZED CENTERS	30-40% Eligible	40-50% Eligible	50-60% Eligible
POTENTIAL FOR CHANGE IN SOCIOECONOMIC MIX	Small	Small to Medium (Direction of Change Depends on State Administrative Practices)	Medium
IMPACT ON STATE-LEVEL COST PER CHILD			
●Current High Compliance States	8-10% Savings	10-14% Savings	15-20% Savings
●Current Low Compliance States	7-11% Increase	2-6% Increase	Slight Savings to Slight Increase

[a] This table should be viewed as a *substantially simplified interpretation* of the various data sets discussed in Chapter Eight of *Children at the Center.* The purpose is to provide a summary overview of the various factors that must be weighed in choosing among the three classroom composition policy options.

[b] Program quality measures were determined with centers in *full compliance,* defined as (1) no centers that violate classroom composition regulatory minimums (i.e., with groups too large and ratios too low) and, (2) no more than 10 to 15 percent (on average) more caregiving staff per center than the regulatory limit.

[c] These are simple summary ranges of each of the indicators shown in Figure 8.1 and should be considered primarily illustrative of the relative difference between policies.

[d] The primary cost comparison in terms of savings and additional children served is with centers in *full compliance* (as defined in *b* above). The impact of alternative monitoring practices — current practice (which does not limit the number of staff that centers may maintain above the regulatory limit), or simply elimination of under-compliance is shown in square brackets.

classroom interactions with adults. Caregivers who work with smaller groups of younger children spend less time on management activities, less time on administrative tasks and more time on social interaction and language development with children. In addition, larger group size is correlated with higher frequencies of distress and apathy for infants and potentially harmful behaviors on the part of toddlers.* Although day care arrangements were not studied as extensively for infants/toddlers as for older preschool children in the NDCS, the evidence does indicate that group size is a potentially important determinant of the quality of day care for children under three.

Infant/Toddler Study results indicate that staff/child ratio is much more strongly correlated with classroom behavior and adult/child interactions for children under three years than for preschoolers. In infant/toddler classrooms, higher ratios are associated with reduced management activities and increased interactions with children on the part of caregivers, and decreased distress, apathy and potentially harmful behavior on the part of children.** While these results do not indicate what particular staff/child ratio requirement is optimal for infants/toddlers, the evidence does not support (as it did in the case of preschool children) relaxation of the current FIDCR ratio requirements.

Current day care practice suggests that group size standards should be more stringent for infants/toddlers than for preschool children. Based on the sample of 54 centers observed as part of the Infant/Toddler Study, the average attendance-based group size is about eight children per classroom for children under two years and 12 children per classroom for children between two and three years – compared to an average group size of 14 children for preschoolers.§ Aside from indicating that relatively stringent group size regulations would not seriously distort current day care practices for infants/toddlers, the NDCS cannot provide further evidence on the appropriateness of alternative group size and ratio requirements for children under three.

CAREGIVER QUALIFICATIONS

- **RECOMMENDATION: Persons providing direct care for preschool children should have participated in a specialized child-**

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* Differences in frequency of time spent on language development and social interaction were statistically significant only in infant groups, containing children under 18 months of age.

** Differences in frequency of apathy and potential danger were statistically significant only in infant groups.

§ Estimates from the NDCS Supply Study's National telephone survey.[9]

related education/training program.* A similar provision was included in the 1968 version of the FIDCR but was made optional in the Title XX revisions to the FIDCR. The training requirement should be mandatory under future regulations, although new staff should be allowed a reasonable period (e.g., a year to 18 months) to obtain such training when they do not have it at the time they are hired. To ensure adequate access to training programs, the current FIDCR provision that operating or administering agencies must provide for or arrange for such programs should be retained.

In addition to staff/child ratio and group size, careful study was made of the qualifications of classroom staff. Years of formal education completed, duration of previous job-related experience, duration of experience at current center and specialized training were considered, as major dimensions of job qualifications, for potential impact on classroom process and test score gains.

Educational attainment per se and previous job-related experience were statistically related to wage rates paid to classroom staff and therefore indirectly related to day care costs. The overall impact of the two variables on cost per child however is quite small. Neither education nor experience could be shown to be a statistically significant determinant of classroom interactions or developmental test scores. Because both characteristics are related to cost but neither is related to any measure of the welfare or development of children, it seems inappropriate to incorporate either into future federal purchasing regulations.

Whether or not caregivers have participated in a formal educational and training program directly relevant to care and education of young children is a determinant of classroom process and test scores of children. Although child-related education/training does appear to have a positive influence on the effectiveness of classroom staff, the data were not adequate to identify a meaningful definition of the form or content of such specialized education/training. *Effects of child-related education/training were particularly strong in centers serving low-income children.* However, these effects are more variable across sites than those of classroom composition and are especially strong in Atlanta, where a single well-defined training program has wide influence.** Analysis of wage and cost data indicate that child-related education/training has no detectable impact on day care cost.

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* Results of the infant/toddler study also suggest that child-related education/training is desirable for providers caring for children under three. Although specialization was rarely statistically significant, it was consistently related to caregiver behavior. (So little child-related education/training was evident among infant/toddler study caregivers that achieving statistical significance was extremely unlikely.)

** See note 9 to Chapter Six.

OTHER REGULATABLE CENTER CHARACTERISTICS

In addition to the primary policy variables – staff/child ratio, group size and caregiver qualifications – the NDCS examined a number of other center characteristics which are either incorporated in current federal and/or state regulations or seemed to be potential candidates for inclusion in future regulations:

- frequency and nature of parent participation in center decision-making;
- physical space available per child;
- types of supplemental services provided by the center (e.g., health-related examinations for children);
- developmental priorities reflected in the center's curriculum and the educational philosophy of the director (e.g., emphasis on social rather than cognitive development); and
- qualifications of the center's director – educational attainment, previous related experience and specialized training.

An effort was made to develop clear and relatively simple definitions and measurement rules for each of these characteristics and to determine the degree to which each was related to the classroom behavior and interactions of adults and children and developmental test scores of children. An attempt was also made to relate these center characteristics (with the exception of program philosophy) to the cost per child of day care services.

As was discussed in Chapter Six, most of these center characteristics were so difficult to define and measure clearly that they could not be examined statistically in relationship to the NDCS measures of classroom process, test gains and day care cost. Only philosophy/program orientation of centers and physical environment could be analyzed statistically for relationships to classroom behavior and test gains.

A decision concerning the appropriateness of including these center characteristics in federal regulations cannot be based on the results of the NDCS. Nevertheless, several observations, some based on NDCS data analysis and some based on common sense, may be useful.

- *Parent Participation.* Consistent with the current FIDCR, over one half of the parents interviewed in subsidized centers expressed a strong opinion that parents should have some role in center governance. Center directors indicated that, as a general rule, parents should at least have unobstructed access to records and staff members' comments about the development of their children. In subsidized centers some 10 percent of parents actually participated in center policy-making and other governance activities. Many parents indicated that their employment was a constraint to greater involvement.

- *Space.* Most state licensing regulations and building codes in many local communities have clear and often detailed provisions concerning minimum square feet per child, adequacy of ventilation and lighting, and safeguards relating to safety and sanitation. Federal regulations on the same topics may duplicate or conflict with such state and local regulations. NDCS analyses showed no relationship between either amount of or a subjective rating of quality of space and gains on standard preschool tests. However, slight relationships were discovered between amount of space and some child behaviors. Since all centers met or exceeded minimum space requirements included in existing regulations, these statistical analyses *cannot be used to justify relaxation of existing requirements.*

- *Supplemental Services.* The current FIDCR contain several provisions which require that centers provide a range of services in addition to the care and supervision of children. In some instances, these provisions have caused centers to provide at relatively high cost services which are available to families through other community agencies. Some centers have ignored the provisions, others have facilitated or coordinated parents' access to services offered by other agencies, and still others have provided services directly. Such diversity complicates the process of setting realistic and equitable reimbursement rates and parent-fee structures. Supplementary services were shown to influence day care cost. Since service data did not adequately reflect the intensity of service provision (number of children served, frequency, whether or not services were provided at center expense), the cost analyses performed are too limited to assess the cost implications of regulatory requirements pertaining to supplementary services. However, it is clear that future regulations should more clearly define precisely what responsibilities for supplemental services are to be carried out by centers. A system should be considered in which the need for supplemental services is determined on a center-by-center basis and funded in addition to reimbursement for standard core day care services. Such an approach would allow: (1) more accurate setting of reimbursement rates among centers; (2) encourage more parents who want and can afford care, but don't need supplemental services, to use publicly subsidized centers on a fee-paying basis; and (3) allow greater responsiveness to variations in the availability of supplemental services in different communities.

- *Philosophy/Program Orientation.* In centers whose staff emphasized cognitive development and/or school readiness, children gained more rapidly on the Preschool Inventory than in other centers. In centers which emphasized group experiences of children rather than individual development, children gained more slowly on the Peabody Picture Vocabulary Test than in other centers. These findings suggest that federal day care policy might try to *promote* emphasis on individual development in centers' program orientation by means of goal standards and/or information dissemination programs. It is difficult to envision, however, that philosophy and program orientation could be effectively controlled by explicit regulations.
- *Directors' Qualifications.* Data from the NDCS national survey of day care centers indicate that even in nonsubsidized centers, most directors have completed some college work and have substantial previous day care related experience.

REGULATORY LANGUAGE AND MONITORING GUIDELINES

Discussion to this point has focused on the advisability of changes in the content of specific regulations. Consideration must also be given to the language in which the regulations are written and to the monitoring guidelines that are used to implement the regulations. Clear and concise language plus detailed and operationally feasible monitoring guidelines increase the likelihood that regulations will be enforced in an equitable, objective fashion at reasonable cost to centers and administrative agencies. It also increases the likelihood that children will be exposed to quality experiences consistent with the intent of the regulations.

This section presents four recommendations bearing on regulatory language and five directed to monitoring guidelines. These nine recommendations are summarized here:

- **Recommendations for Regulatory Language:**
  - *The staff/child ratio and group size limits in future regulations should be stated in terms of absolute minimum standards rather than in terms of what should "normally" prevail.*
  - *Staff/child ratio requirements should be stated in terms of scheduled enrollment and scheduled assignments of staff to child supervision and should apply to all times of the day and all days of the week.*
  - *Day care centers should be required to make contingency plans for obtaining substitute classroom staff in the case of caregiver absence.*
  - *The group size limit should be strictly enforced except during lunch, nap time and playground activities.*

- **Recommendations for Monitoring Guidelines:**
  - *Both an examination of schedules of child and staff hours and observation visits should be used to assess compliance.*
  - *Group size should be monitored on a group-by-group basis.*
  - *Compliance with staff/child ratio requirements should be determined at the center level and not on a classroom-by-classroom basis.*
  - *For determination of compliance with ratio requirements children should be counted in terms of the number of hours they are scheduled to attend the center, and staff should be counted in terms of the total number of hours each is scheduled to work directly with children.*
  - *Time spent by volunteers working with children should be counted toward satisfying ratio requirements only if the volunteer regularly spends ten hours or more per week working in the center's classrooms or if the volunteer is acting as a substitute for a regular caregiver who is absent.*

Each of these recommendations is discussed below.

Regulatory Language

The selection of federal day care regulations can be approached from either of two very different perspectives. Federal regulations can be viewed as goal standards – optimal characteristics for day care centers to adopt – on either side of which some modest deviations will be permitted. Alternatively, regulations can be viewed as absolute minimum standards below which no deviations will be tolerated. The staff/child ratio provisions in licensing regulations in some states have clearly been approached from the latter perspective. The high degree of overcompliance with state ratio requirements in those states is evidence that both parents and providers prefer day care services that are well above state-established standards for minimally adequate day care programs.

There is substantial evidence to indicate that the FIDCR in general, and the FIDCR staff/child ratio requirements in particular, are viewed by many as goal standards. First, many of the provisions of the current FIDCR are so vague in language and so inconsistently adhered to in practice that they cannot be viewed as either enforceable or effective. Second, the FIDCR ratio provisions state that staff/child ratios must "normally" be above certain minimum limits. The use of the term "normally" suggests that occasional substantial deviations from the specified limits are quite acceptable.

- **RECOMMENDATION: The staff/child ratio and group size limits in future regulations should be stated in terms of absolute minimum standards rather than in terms of what should "normally" prevail.**

Regulations that place limits on typical, normal or average behavior create several problems. First, center directors do not have direct control over the "normal" group size and staff/child ratio prevailing at their centers. What the normal group size and ratio are will be affected by absence rates, a factor over which directors have little control. Second, specification of regulatory limits in terms of normal conditions creates ambiguity, for one can define normal conditions in a variety of ways.* Third, specifying limits only on normal conditions leaves undefined how staff/child ratios and group size are allowed to deviate from the normal limits for short periods of time. A staff/child ratio as low as 1:40 for one or two hours would not violate the apparent intent of the current FIDCR ratio provisions. Yet such a ratio would certainly not ensure the safety of children in case of fire or other serious emergency.

The risk involved in adopting combinations of regulations and monitoring guidelines which are interpreted as goal standards is evident from the variations in the degree of compliance with FIDCR ratio standards across states. Subsidized day care centers in Texas, for example, operate with an average center-level staff/child ratio of 1:7.3; only 51 percent of the subsidized centers in that state currently have sufficient classroom staff to comply with FIDCR ratio limits. In contrast, subsidized centers in North Carolina operate with an average center-level ratio of 1:4.4, and 91 percent of the state's centers are currently in compliance with FIDCR ratio standards. *If the federal government does not adopt a consistent, unambiguous and determined posture with respect to the objectives, content, interpretation and enforcement of federal day care purchasing regulations, major inequalities in the characteristics of day care services across states will persist.* Continued implicit use of regulations as goal standards will perpetuate the current inequalities.

- RECOMMENDATION: **Staff/child ratio requirements should be stated in terms of scheduled enrollment and scheduled assignments of staff to child supervision and apply to all times of the day and all days of the week.** The advantage of this regulatory language is that it produces the same limits on "normally" prevailing ratio and group size as the current FIDCR language without introducing ambiguity and without leaving unspecified what deviations from normal conditions are allowed for short periods of time. In addition, the requirements are specified in terms of scheduled classroom configurations, over which day care centers have direct control. Finally, by specifying that requirements are to be met at all hours of the day and week, it is clearly established that regulations are intended as absolute minimum standards rather than goal standards for "normal" situations.*

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* For example, the mean, median and modal absence rates in day care centers are 12%, 10% and 0%, respectively. If normal ratio and group size are defined in terms of the normal absence rate, which of these three figures should be used as the "normal" rate?

When the three policy options were defined above, limits on staff/child ratio and group size were defined in terms of average attendance (attendance basis) and in terms of scheduled enrollment (enrollment basis). Since the observation-based measures of ratio and group size used in the NDCS child effects analyses reflect average attendance,** the attendance-based definition was used to link results of child effects analyses to alternative regulations. The enrollment-based measures were included to define the absolute outer limits each policy set for ratio and group size. The conversion from attendance basis to enrollment basis for the three options for three-, four- and five-year-olds and for the current FIDCR provisions for younger and older children is presented in Table 8.4. It is recommended that the numerical values written into the language of new regulations be those shown in the last two columns of Table 8.4.

- RECOMMENDATION: **Day care centers should be required to make contingency plans for obtaining substitute classroom staff in the case of caregiver absences.** Staff/child ratios may fall below the limits specified in regulations when classroom staff are absent. To prevent this from happening centers should have access to substitute classroom staff – either center staff not normally assigned to child-supervision (e.g., the center director) or temporary staff recruited on a short-term basis from outside the center. Access to substitutes should be certain enough that actual ratios never fall below minimum required ratios.

- RECOMMENDATION: **The group size limit should be strictly enforced except during lunch, nap period and playground activities.** The dynamics of the day care environment make it difficult for centers to maintain small group sizes during the entire day. NDCS analyses did show that the group size prevailing during a three- to four-hour period each morning was important for child outcomes. Attempts to strictly enforce group size requirements during lunch, nap period and playground activities, however, or during arrival and departure time when groups are generally smaller and change composition often, would seriously disrupt current day care practices.

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* Although center-level ratio requirements should apply to nap time, monitoring guidelines should handle the calculation of staff/child ratio in such a way as to allow caregivers to take a break when children are napping. Refer to the guidelines section below for further discussion.

** Only children and staff actually present were included in observation-based counts of children and adults.

Table 8.4 **Attendance- and Enrollment-Based Regulations for Staff/Child Ratio and Group Size: (NDCS Recommendations for Three-to Six-Year-Olds and Title XX FIDCR for other Ages)**

	Attendance Basis		Enrollment Basis[a]	
Age of Child	**Ratio**	**Group Size**	**Ratio**	**Group Size**
0-6 weeks[b]	1:1	n.r.	1:1	n.r.
6 weeks to 3 years[c]	1:4	n.r.	1:5	n.r.
3 years to 6 years				
Policy A	1:7	14	1:8	16
Policy B	1:8	16	1:9	18
Policy C	1:9	18	1:10	20
6 years to 10 years[b]	1:15	20	1:17	23
10 years and over[b]	1:20	25	1:23	28

n.r.: no current FIDCR requirement.

[a] The average child absence rate estimated from NDCS Supply Study data is 12% and has been used to convert attendance-basis requirements to enrollment-basis requirements (all numbers rounded up).

[b] The effects of ratio and group size on child-outcomes were not studied in the NDCS for children in these age groups. It should be noted, however, that both the current FIDCR classroom composition requirements for children over six years of age are inconsistent. In each case the specified ratio is likely to dominate over the group size requirement. This is especially true for children 10 years and older where a group of 25 would require 2 caregivers, a 1:12.5 ratio, which is considerably higher than the 1:20 allowed. Given NDCS findings, it is reasonable to suggest that a single consistent standard, might well be appropriate for children over six.

[c] Given the "even multiple" rule for ratio, a group size requirement of 8 or 12 would be appropriate for this age. This would translate to an enrollment-basis of 10 or 15.

Monitoring Guidelines

In Chapter Three and in the final report of the NDCS Supply Study[10] (see Appendix A), a number of important issues were discussed concerning the appropriateness of alternative monitoring guidelines for the enforcement of staff/child ratio and group size regulations. The issues raised and the conclusions reached are summarized briefly here. The earlier discussion of the three policy options (e.g., estimates of impact on quality and cost) are based on the assumption that these conclusions about monitoring guidelines would be adopted when new regulations are implemented.

- **RECOMMENDATION: Both an examination of schedules of child and staff hours and observation visits should be used to assess compliance.** In determining whether or not a particular day care center is in compliance with a set of ratio and group size regulations, a monitoring agent has a choice of two basic, non-mutually exclusive measurement procedures. The agent can (1) examine schedules maintained by centers of the hours children and staff are at the center and arranged in specific classrooms; and/or (2) visit individual classrooms to count the number of children and adults present and determine prevailing staff/child ratios and group sizes. On the basis of NDCS experience, both measurement procedures should be employed in each center.

The measures of ratio and group size used in the NDCS examination of classroom process and developmental test scores of children were averages of observed ratios and group size, calculated from a relatively large sample of observations, spread over different times of the day, days of the week and weeks of the year. Such a large number of observations would not be economically feasible as a monitoring procedure.* Fortunately, NDCS analyses demonstrate that for most centers carefully maintained records of schedules of child hours and caregiver classroom hours, adjusted for expected absence rates, are highly reliable substitutes for multiple classroom observations.

Schedules substantially underestimate group size and the number of attendant caregivers, however, when classes are merged. Center records maintained for monitoring purposes should therefore include reasonably detailed information regarding the frequency of and reasons for merging classes and should identify the classes involved. This information, which can help the monitor determine the acceptability of the practice in each case, should be accumulated retrospectively, since many centers which merge classes do not do so recurrently as part of the weekly activity schedule.

To check the validity of schedule records and to augment schedule based information in centers which frequently merge classrooms, observations of actual classroom arrangements should also be employed. When wide discrepancies between information from schedules and observations are found, the center should be considered out of compliance. However, penalties should not be imposed until additional monitoring visits establish that actual staffing and group patterns are regularly out of compliance with federal requirements.

- **RECOMMENDATION: Group size requirements should be monitored on a group-by-group basis.** Earlier discussion in this chapter and in Chapter Six established that group size is a critical determinant of a broad spectrum of classroom behaviors and test gains. Since differences as small as four children per group have an important influence on child outcomes but do not significantly affect cost per child, it seems appropriate to monitor group size as carefully as possible on a group-by-group basis.

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* On the other hand, a large number of observations do not appear necessary for measuring ratio and group size in the short run. Analyses of NDCS data show that three or four four-minute observations in each class during a single morning can yield reasonably accurate estimates of the average ratio and group size prevailing during the week and perhaps even the month in which the observations are made.

Monitoring agents should examine scheduled classroom assignments of children and should actually observe in each classroom to determine compliance. Examination of schedule information is important, to determine whether merging is an issue and to determine whether observation-based information indicates compliance only as an artifact of an abnormally high absence rate at the time of the observation visit.

Because relatively stringent monitoring procedures for group size are not likely to influence cost per child, *the group size requirement applicable in classrooms containing children of mixed ages*[*] *should be the requirement specified for the youngest child in the group.* In centers organized on an open-classroom basis, monitoring agents should request schedule-based information indicating which children are assigned to which adults, and must use some degree of subjective judgment to determine the size of clusters of children under the supervision of a single adult or a "team" of adults.

- **RECOMMENDATION: Compliance with staff/child ratio requirements should be determined at the center level and not on a classroom-by-classroom basis.** If ratio is measured at the center level, compliance is determined by ascertaining whether the center as a whole has sufficient staff resources to provide adequate supervision for the number of children receiving care at any time during the day, taking into account the distribution of these children across age categories to which different FIDCR ratios apply.[**] There are several advantages to measuring ratio only at the center level for determination of regulatory compliance. First and most important, such an approach is cost-effective. Ratio has not been shown to have as significant an effect on child outcomes as does group size, yet its impact on cost per child is substantial. Experimentation with data obtained from the NDCS Supply Study[11] indicates that monitoring ratio compliance on a group-by-group basis instead of at the center level would increase classroom staffing requirements by 9 to 16 percent, depending upon the ratio requirement which is imposed in age-mixed classrooms.*

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[*] Future group size and ratio requirements for children under three years of age may be considerably more stringent (e.g., 10 children per group and 1:5 ratio on an enrollment basis) than those for children three and older. If so, a severe notch effect will be created which will discourage centers from enrolling children under three years of age. To reduce the severity of this notch effect, centers should be allowed for short periods of time to count some small number of children (three or four) between 30 and 36 months of age as three-year-olds for determination of *group size* compliance. (Whenever a center has a sufficient number of younger children, it can form a separate group.) Note that this recommendation does not limit age-mixing, such as family groupings. It simply means that such groups will have to be smaller than would be allowed by regulations for the older children in the group.

[**] If ratio is measured at the classroom level, not only is the sufficiency of staff resources being examined but specific matches between adults and children are being examined for appropriateness.

There are other advantages to measuring ratio only at the center level for determination of regulatory compliance. First, less information is needed, and the ease of obtaining the information is much greater if a center-level measure is used instead of a class-level measure. Second, measurement accuracy, especially in terms of the correspondence between schedules and observations, is substantially greater at the center level. Third, the issue of merging classes is immaterial in monitoring ratio if center-level measurements are used. Finally, a center-level measure provides directors with somewhat more flexibility in adjusting ratios slightly in individual classrooms – to satisfy different developmental or special needs of individual groups of children and to allow for changes in activities over the course of the day.**

- **RECOMMENDATION: For determination of compliance with ratio requirements using enrollment and staffing schedules, children should be counted in terms of the number of hours they are scheduled to attend the center and staff should be counted in terms of the total number of hours each is scheduled to work directly with children.** This recommendation rules out counting children and staff on a head-count basis (i.e., without regard to full-time/part-time status).§ Analysis of NDCS Supply Study data has shown that part-time staff are far more common than part-time children and that, as a result, a head-count compliance measure artificially inflates staff/child ratios and measured compliance. This recommendation also rules out hours of non-classroom staff (e.g., bookkeepers) and the non-classroom activities (e.g., part-time cooking or record-keeping) of caregivers as countable toward satisfaction of ratio requirements. In doing so, it emphasizes a measure of staff/child ratio closest to the adult/child arrangements one would actually observe in classrooms.

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* If ratio is measured at the group level, age mixing raises the issue of which limit to apply – the ratio requirement for the youngest child in the group, the limit for the largest age-cohort in the group or some weighted average of the limits that apply to each age group. See Part Two of Appendix A for further discussion.

** For example, if the minimum ratio requirement were 1:9 and maximum group size 18 (enrollment basis), a director might compose three classrooms as follows: for three-year-olds, a group of 14 children with two caregivers (1:7); for four-year-olds, a group of 16 children with two caregivers (1:8.5); and for five-year-olds, a group of 15 children with one caregiver (1:15). The overall ratio for the 45 children with five caregivers would be in compliance at 1:9, but the individual groups and ratios would vary by the developmental level of the children.

§ However, during monitoring observations in classrooms, staff and children must obviously be counted on a head-count basis.

An example will illustrate the computational procedures which might be used to determine ratio compliance in a day care center from enrollment and staffing schedules. Suppose the enrollment in a day care center is as follows:

Age of Child	Enrollment	Total Scheduled Hours/Week	Schedule-Based Ratio Requirement Children/Adult[a]	Required Classroom Staff Hours
0-6 weeks	0	0	1	0.0
6 weeks-3 years	5	180	5	36.0
3-6 years	40	1475	8[b]	184.4
6-10 years	10	200	17	11.8
10-14 years	0	0	23	0.0
TOTAL	55	1855	n.a.	232.2

[a] See Table 8.4 for derivation of schedule-based ratio requirements.

[b] Assumes adoption of Policy A.

Data on enrollment and total scheduled hours per week must be obtained from the center's enrollment roster. For each of five age categories total scheduled child hours per week is divided by the corresponding regulatory limit of children per adult. The resulting numbers, recorded in the last column, are added to obtain a figure for the minimum number of caregiver classroom hours required for this center. If all caregivers at the center work 40 hours per week with children, the center would be required to have available 5.8 (232.2/40) caregivers. Rounded up to the next higher integer, the 5.8 number implies that a minimum of six classroom staff should be employed.*

It was recommended earlier that centers should be required to comply with staff/child ratio regulations during all hours of the day and week. In the illustration above, child-hours and required caregiver-hours were computed on a weekly basis. In centers in which enrollment fluctuates between the morning and afternoon and/or across days of the week, the use of weekly hours to compute staffing requirements will hide such enrollment fluctuations. If staffing requirements in such centers are based on weekly enrollment, computed staff requirements will overstate actual requirements during hours or days when enrollments are low and understate actual requirements at other times. Consequently, the use of weekly enrollment schedules in such instances will not guarantee that ratio requirements are met at all hours of the day or week.

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* Experimentation with NDCS Supply Study data indicates that alternative procedures of rounding up or rounding off fractional staffing requirements have little effect on the number of caregivers required across all subsidized centers. Since some leeway would already be built into the monitoring computation by determining ratio compliance at the center level rather than on a group-by-group basis, it seems appropriate to deal with fractional requirements by always rounding up to the next full-time staff person.

Another aspect of fluctuation concerns the calculation of naptime staff/child ratio. NDCS data show that this is the time when caregivers often do other things – prepare activities for the remainder of the afternoon, attend meetings or in-service training sessions, or just relax and ready themselves for the remainder of the afternoon. In a classroom with two or more caregivers, caregivers can take their break once the children are settled, but could still be counted for compliance purposes providing they are in the center and available to a group of napping children if needed. Such guidelines could be adopted for both schedule-based calculations (in which the caregiver's hours would be included even though they were not necessarily classroom hours) and for observation-based calculations (in which the number of available, rather than actual, caregivers would be used). The guidelines could require, of course, that at least one caregiver remain with each group of napping children at all times.

Fluctuations in enrollment over the course of the day or across days of the week significantly increase the complexity of the monitoring process. To use enrollment schedules on a daily basis to determine staffing requirements would require a worksheet similar to that shown in Figure 8.2. If enrollment schedules for each morning and afternoon were used to compute staffing requirements, an even more complex worksheet would be required. Such worksheets require a substantial amount of time to fill out, represent a substantial reporting burden for centers and are not necessary in the great majority of centers.*

It seems appropriate to leave the problem of dealing with fluctuations in enrollment across hours of the day and week to the discretion of individual monitoring agents. Ratio requirements should be adhered to during all hours of the day and week, but no single procedure for monitoring compliance should be applied in all centers. Two or more observation visits should be made to each center each year, and these visits should be used to "spot-check" compliance. In large centers with substantial part-time enrollment, the monitoring agent may require center directors to maintain detailed enrollment and staffing schedules and may use worksheets such as that in Figure 8.2. In small centers, the hour-to-hour and day-to-day compatibility of enrollment and staffing patterns may be dealt with by use of less complex worksheets and through discussions with center staff.

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* Most centers are small (40 or fewer children) and have few or no children enrolled on a part-time basis.

- **RECOMMENDATION: Time spent by volunteers working with children should be counted toward satisfying ratio requirements only if the volunteer regularly spends ten hours or more per week working in the center's classrooms or if the volunteer is acting as a substitute for a regular caregiver who is absent.** Only 35 percent of volunteers spend 10 hours or more per week working in day care centers; this recommendation thus excludes from compliance computations a large number of volunteers. However, the total number of hours excluded is relatively small and has little impact on the degree of compliance with ratio standards among subsidized centers.* In fact, complete exclusion of volunteer hours would only marginally reduce the ability of the average subsidized center to achieve compliance. The reason for not completely excluding volunteer hours is that a small number of centers (e.g., parent co-op centers) are staffed almost entirely by volunteers. These centers would be unreasonably penalized by such a policy.

The choices made in establishing monitoring guidelines are not trivial. Evaluated against the current FIDCR ratio requirement, the choice of definitional, measurement and procedural guidelines adopted can have a very significant impact on the effective stringency of staff/child ratio requirements. The Administration for Public Services (APS), the division within HEW with responsibility for developing interpretations and monitoring guidelines to implement the FIDCR, has established official recommendations on most of these issues. Most of the choices APS has made reduce the effective stringency of the FIDCR ratio standards relative to alternative choices. Had significantly more stringent monitoring guidelines been adopted, the minimum number of staff required by the FIDCR in subsidized centers would have risen by 34 percent. In addition, the percentage of subsidized centers with sufficient staff to satisfy the FIDCR would have fallen from 68 to 39 percent. The number of additional staff required to satisfy the FIDCR in currently noncomplying centers would have increased from 5500 to 16,100 (see Table 31 in Appendix A).

These data indicate the validity of a very important point: *The stringency of the monitoring guidelines used to interpret and enforce a set of day care regulations can have as large an impact on*

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* Data from the NDCS Supply Study.[12]

Figure 8.2: Worksheet for Determination of Compliance with Staff/Child Ratio Requirements on a Daily Basis

Data Item	Age of Child					
	Birth to 6 Weeks	6 Weeks to 3 Years	3 Years to 6 Years	6 Years to 10 Years	10 Years to 14 Years	Total
Required Staff/ Child Ratio	1:1	1:5	1:8	1:17	1:23	
Monday Number Children Enrolled	0	10	41	12	0	63
Scheduled Child Hours	0	80	328	38	0	446
Required Staff Hours	0	16	41	2.2	0	59.2
Tuesday Number Children Enrolled	0	5	41	10	0	56
Scheduled Child Hours	0	40	328	30	0	398
Required Staff Hours	0	8	41	1.8	0	50.8
Wednesday Number Children Enrolled	0	10	40	10	0	60
Scheduled Child Hours	0	80	320	30	0	430
Required Staff Hours	0	16	40	1.8	0	57.8
Thursday Number Children Enrolled	0	5	40	10	0	55
Scheduled Child Hours	0	40	320	30	0	390
Required Staff Hours	0	8	40	1.8	0	49.8
Friday Number Children Enrolled	0	10	41	12	0	63
Scheduled Child Hours	0	80	328	38	0	446
Required Staff Hours	0	16	41	2.2	0	59.2
Week Required Staff Hours	0	64	203	9.8	0	276.8

the performance standards required of day care centers as the stringency of the regulations themselves. For example, the adoption of Policy B (attendance-based ratio and group size limits of 1:8 and 16 respectively) and the implementation of a very stringent set of monitoring guidelines would require almost exactly the same number of classroom staff in subsidized centers as those imposed by the current FIDCR and the current more moderate APS monitoring guidelines.

The recommendations presented here are designed to maximize the clarity of monitoring guidelines and to minimize the administrative burden of the monitoring process. The primary consideration underlying the recommendations, however, is to insure that day care programs, consistent with the intent of the classroom composition regulations, protect the welfare and promote the development of children.

APPROPRIATIONS, FUNDING AND RATE-SETTING

An examination of issues pertaining to day care appropriations, funding and rate-setting was not within the scope of the NDCS. A number of observations on these issues, however, are supported by the results of the study or are corollaries to the policy recommendations presented above.

The policies and administrative practices which the government uses in appropriating funds for day care services, allocating funds to centers and children and setting the reimbursement rates paid to individual children can have profound effects on the day care market in general and on the cost and quality of care for children. Regulations, for example, cannot be effective unless rate-setting practices provide centers with sufficient funds to comply with regulatory requirements. Practices used in setting reimbursement rates affect staff/child ratios, staff salaries and the range and intensity of supplementary services (e.g., health screening) provided by centers. In deciding on the allocation of day care funds, government agencies can on the one hand significantly promote socio-economic integration by implementing sliding fee schedules for day care or, on the other hand, significantly reduce integration by purchasing all day care services at a set rate from a smaller number of completely subsidized centers.

If the recommendations presented earlier in this chapter, regarding regulatory policy and monitoring procedures, are adopted as part of new government day care policy and administrative practice, several changes in rate-setting practices should also be made.

- *Reimbursement based on enrollment.* It was recommended earlier that staffing requirements be based on scheduled enrollment rather than on attendance. In addition, centers should hire substitute classroom staff to cover classroom assignments when regular staff are absent. Both of these recommendations, if adopted, should be accompanied by appropriate day care reimbursement and rate-setting practices. Centers should be reimbursed for the cost of substitute caregivers. In addition, actual reimbursement paid to centers should not be reduced when children are absent unless a child is absent more than five days per month.[*] About one-third of subsidized centers are currently not paid at all for days when subsidized children are absent.

- *Age-differentiated reimbursement rates.* Variations in cost per child have an important effect on the per-child cost of day care services. If ratio requirements are relatively stringent for children under three years and relatively lenient for children over six years, these differentials will produce significant differentials in day care cost for children of different ages. Government day care reimbursement rates should reflect these differences in per-child cost. Only six percent of subsidized centers currently receive age-differentiated government reimbursement.[**]

- *Rate-setting based on cost analysis.* Reimbursement rates should allow day care centers to satisfy all of the provisions of federal and state day care regulations. Centers currently must meet many local, state and federal regulations – minimum staffing limits, constraints on space utilization, availability of staff training programs, provision of supplementary services. No statistical model can accurately predict how these requirements will affect the cost structure of individual centers.[§] Rates should be set for individual centers, therefore, by means of an analysis of expenditure and revenue budgets submitted by individual centers seeking to enroll subsidized children. Such an approach would significantly improve the correlation between cost per child and government reimbursement rates that currently exists in many states.[§§]

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[*] Schedule-based staff/child ratio requirements, recommended earlier over attendance-based requirements, presume that the average child will be absent 12% of the days of the year (2.6 days/month). Five days is recommended here to allow centers some leeway for unexpected heavy absences. Centers deserve some leeway, for they cannot adjust salary expense (refuse to pay staff) every time absence rates are abnormally high.

[**] NDCS Supply Study data.[13]

[§] Cost models, such as the econometric model used in the NDCS, can accurately predict the impact of regulations on the average cost of a large sample of centers.

[§§] NDCS Supply Study data indicate that a very low correlation currently exists.

Unless these changes in rate-setting and reimbursement practices are adopted administrative practices will continue to conflict with regulatory policy and some centers will be reimbursed inequitably for the services they provide or be forced to operate below compliance levels in order to survive.

Further suggestions for improved funding and reimbursement practices are supported by NDCS data:

- *Increase day care wage rates.* If federal minimum wage laws are to be observed, state reimbursement rates must be set high enough that centers are able to pay all staff at least that current minimum. Almost 30 percent of lead teachers and 45 percent of classroom aides are paid wages less than or equal to the federal minimum wage.[*] As noted in Chapter Seven, even minimum wage rates are not sufficient to lift most day care staff, many of whom are the primary or sole income-earners in their families, above the poverty threshold.[**] Part-time staff, in addition to full-time staff, pose an additional issue. If they are not paid at least federal minimum wage, there is an economic incentive for centers to rely primarily on part-time staff. Centers should be permitted to build reasonable pay differentials for different staff into their budget estimates for reimbursement purposes; however, differentials should be justified on the basis of the job-related qualifications of individual staff members. NDCS results provide no evidence to support paying higher starting wages for staff with more experience or stronger general educational backgrounds.[§]

- *Stop reimbursement for substantial overcompliance.* Many subsidized day care centers currently operate with staff/child ratios substantially above the minimum levels established by federal regulations. Some degree of overcompliance (on average, 10-15%) with ratio requirements is unavoidable in centers, due to short-term fluctuations in enrollment, changes in the age distribution of children and the inability of centers to operate exactly at the limits established by ratio requirements. This is particularly true in small centers.[§§] Substantial overcompliance (e.g., actual staff employed more than 30% in excess of the minimum center-level staffing requirement) produces an ineffective use of day care appropriations. Reimbursement for such significant overcompliance should be eliminated by careful analysis of center budgets as part of the rate-setting process.

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[*] Based on data from the 57 NDCS study centers and the 70 centers in the on-site survey of the NDCS Supply Study.[14]

[**] The poverty threshold as defined by the Department of Labor, is $6,000 per year for a family of four, almost exactly the income from a job paying the current federal minimum wage of $2.90 per hour.

[§] Payment of higher wages to staff with special skills and longer tenure is a standard practice in the U.S. labor market and should not be discouraged in day care centers.

[§§] Under Policy C, for example, a center with one enrolled group of 20 children would be required to have two caregivers. The addition of one more child would necessitate adding one more caregiver, which would change the ratio to 1:7 (3/21), producing a 30 percent overcompliance.

Although not directly related to the changes in regulatory policy discussed earlier in this chapter, these changes in reimbursement and rate-setting practices are quite important. They have potential for significantly affecting the cost of day care services, the number of children paid for by government subsidies and the quality of the staff responsible for the care and development of children.

COMMENTARY: The National Day Care Study from the Perspective of Black Social Scientists

From its inception, the NDCS was subjected to rigorous scrutiny by technical and policy experts who constituted the study's advisory panel of consultants. The study's design, analyses and findings have been reviewed by this group of consultants, consisting of psychologists, economists, day care providers and consumers, and child development experts. Although not originally well represented, black and other minority consultants later became key members of the advisory panel and formed an independent Task Force of the NDCS. The following discussion traces the origin and major concerns of the Task Force established by minority consultants.*

FORMATION AND FUNCTION OF THE TASK FORCE

Although preliminary sample information showed that two-thirds of the NDCS Study population was black, black researchers and policy experts were involved only to a limited degree in the initial design phase (Phase I) of the NDCS and in the selection of process and outcome variables and measurement strategies. Of 15 panel consultants only one person was black.

In March 1976, Dr. Asa Hilliard, a member of the SRI consultant panel who later joined the Abt consultant panel, expressed concern about the appropriateness of the NDCS conceptual framework and instruments for black children and caregivers, in his review of SRI's draft report on NDCS instruments.

Both Abt Associates and ACYF responded to this critique. Recognizing that a stronger minority voice among NDCS consultants was essential to the quality of the study's research, Abt Associates and ACYF moved to increase minority representation on the NDCS advisory panel.

In July 1976 (end of Phase II), at a joint meeting of the consultant panels for the NDCS and the National Day Care Home

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* This section summarizes a detailed report of the concerns of the Black Consultant Task Force, written by Ricardo Millett and Arthur Mathis, senior social scientists on the Abt staff. The report has been reviewed by the Black Task Force and reflects the concensus of its members: Robert Bland, Virginia Burke, Jean Carew, Asa Hilliard, Harmon Walker and James Young. The report, "The National Day Care Study from the Perspective of Black Social Scientists: Reflections on Key Research Issues" is contained in Volume IV-A of the Final Report of the National Day Care Study.[1] The report contains, in its appendices, reprints of Task Force memoranda, reports and important correspondence.

Study (NDCHS), the Task Force (then called the Black Advisory Board) constituted itself as a distinct body to address technical and policy concerns and other issues having special relevance for minorities. The concerns of the Task Force were articulated in a position statement made at that time, which urged the NDCS to carry out its research efforts with extreme care, given the history of previous national policy studies based on the analysis of "cognitive gains" in black children. The statement included a set of recommendations and addressed detailed questions to the NDCS research staff. The recommendations called for more detailed review and advisory procedures for black and minority consultants of both the NDCS and the NDCHS and set out research issues of particular concern. ACYF and Abt Associates concurred with the Task Force's requests and took steps to establish appropriate review procedures and to address the specific research issues identified.

THE MINORITY REVIEW PROCESS

The Task Force made additional procedural recommendations for study review in a report of its December 1976 meeting. These recommendations were accepted by ACYF and implemented by ACYF and Abt Associates to insure ongoing, substantive participation of the Task Force in reviewing all subsequent NDCS design, implementation and analytic tasks. The Task Force constituted a special sub-group of the advisory panel for review of all reports of the study prior to publication.

In its December 1976 report, the Task Force emphasized that its priority issue was the policy implications of the National Day Care Study. "However," the report stated, "prior to any consideration of such policy issues our immediate concern involves basic research related issues that will generate and ensure qualitative and unimpeachable research design."[2] These concerns and the corresponding NDCS responses are summarized below.

MAJOR CONCERNS OF THE BLACK TASK FORCE

The Task Force's major concerns centered on the *equity* and *appropriateness* of the study's design, measurement and analytic techniques for black children and caregivers. Task Force members were wary of the widespread "history of shallow research and negative consequences in social policy" that had affected blacks and other minority groups.[3]

The Task Force's recommendations addressed three general areas of concern:

- The adequacy and completeness of the NDCS conceptual framework;
- The reliability, validity and fairness of study design and implementation for the black children and caregivers studied; and
- The significance and relevance of the study's data analysis and policy implications for affected minorities, particularly blacks.

Conceptual Framework

The first major criticism made by the Task Force in July 1976 was that an adequate review of the black child development literature had not informed the study's conceptual framework and design phase (I). Although a subsequent review was undertaken by senior social scientists at Abt Associates,[4] earlier consideration would have enabled the NDCS to proceed from the beginning with greater awareness of black concerns. The Abt review indicated that, given the state-of-the-art of psychometrics in the child development and early childhood education fields, the NDCS cognitive measures represented, with qualifications, the best available. Regardless, the Task Force continued to express serious concern about the use of standardized tests as measures of cognitive development of black children.

The second major criticism by the Task Force of the NDCS conceptual framework concerned the study's approach to defining "quality day care." The NDCS framework did not rely upon a specific developmental theory of quality day care. Instead, quality was conceptualized as a continuum ranging from harm to optimal effects for children. A variety of measures of child and caregiver outcomes were selected to construct alternative definitions of quality care.

The Task Force warned that major emphasis on the results of the child cognitive measures – the Preschool Inventory (PSI) and the Peabody Picture Vocabulary Test (PPVT) – would inappropriately assume that preschool education and school-readiness were the primary goals of day care. The Task Force argued that day care programs are not intervention programs (like Head Start) designed to improve the cognitive achievement of a homogeneous population of children. Thus, measurement of the cognitive effects of center characteristics evaluates day care centers against educational goals that centers might not hold as paramount. The Task Force emphasized that interpretation of effects findings should address these issues.

However, the NDCS design was not constrained by a narrow emphasis on cognitive achievement. The PSI and PPVT were elements of a *set* of measures selected to assess children's socioemotional, cognitive and physical development. In Phase III data analyses, PSI and PPVT adjusted gain scores were evaluated in conjunction with observational data on child and caregiver behaviors. Effects findings in Chapter Six present patterns of beneficial effects and do not rely on test scores in isolation.

Finally, inclusion of cognitive measures in the overall definition of quality care reflects the opinions expressed by parents and center directors during Phase II and Phase III interviews. Preparation for school was important to most parents: encouraging an interest in learning and developing the child's emerging language skills were among aspects of school preparation specifically identified by parents. Center directors' response to questions on day care program orientation generally rated school preparation as an important aspect of their programs. However, the interviews also reinforced a major point made by the Task Force: Day care programs encompass a wide variety of goals for children that respond to the naturally diverse interests of parents and caregivers.

DESIGN AND IMPLEMENTATION

The most serious criticisms of the Black Task Force focused on the appropriateness of NDCS outcome measures (standardized cognitive tests and observation instruments) for black children and caregivers and the pitfalls of racial bias in testing and observation. Research by a growing number of scientists indicates that:

- The current state-of-the-art of psychometric measures has not successfully met the challenge of constructing culture-free measures. Conventional tests are not accurate in describing the experience or assessing the competencies of blacks and other ethnic minorities.
- There are cultural differences (or at least behavioral, communication and interactional style differences) between blacks and whites that are not taken into account in the construction or interpretation of standard cognitive and socioemotional tests.
- There is evidence that standardized tests and observation instruments are subject to race-of-tester/observer effects that pose reliability problems when these measures are used for black children.

Cognitive Measures. In Phase II of the NDCS, a comprehensive battery of child outcome measures was field tested: the PSI, Matching Familiar Figures Test, the Motor Inhibition Test, the Pupil Observation Checklist and the McCarthy Scale of Verbal Memory. Of these, only the PSI was determined psychometrically acceptable for use in Phase III. Although not part of the original battery, the PPVT was added in Phase III as a measure of language development because this skill could not be assessed independently by the PSI. Psychometric reliability notwithstanding, the Task Force elucidated major concerns associated with the PSI and the PPVT. As a result, Abt Associates, with support from ACYF and encouragement from the Task Force, undertook an extensive review of these measures in the paper by Millett and Mathis.[5] The results of this review are summarized below.

The PSI was developed for Project Head Start in 1965 as a measure of achievement in areas necessary for success in school. One aim of the test was to provide educators with an instrument to gauge the degree of remediation a disadvantaged child needed before entering school so that deficits might be reduced or eliminated.[6] As a predictor of achievement in the white middle-class school system, the PSI was not designed to be a "culture fair" test. As such, it should not be assumed to be free of cultural bias.

The instrument has undergone several revisions. A 64-item version was standardized for the Head Start population in 1969. There have been serious criticisms of the standardization techniques, indicating that the 1969 sample may not have been representative of Head Start children across the country.

A 32-item version of the PSI was developed by Stanford Research Institute and first used in the Head Start Planned Variation Study in 1971. The decision to use the 32-item version of the PSI in the NDCS was based primarily on a review of this version by Walker and her colleagues.[7] This study, however, reported a number of concerns regarding use of the PSI, including cultural bias, scoring ambiguities, possible practice effects and questionable predictive validity.

An Educational Testing Service (ETS) study found large performance differences on the PSI among socioeconomic groups, supporting the position that the test is not culturally fair.[8] Walker and other critics have suggested that certain items do not reflect school achievement biases, but rather regional and ethnic or racial biases that are unrelated to school success. The biases of the test are defensible on the grounds that "there are a number of skills which every child, whatever his background, will have to possess to be successful in kindergarten," and also because the test does not purport to be a culture-free assessment of cognitive ability.[9]

Walker and her colleagues also noted scoring ambiguities in the PSI as an area of concern. Some items allow credit for having part of an answer correct and others do not. Walker's work also points out that the PSI may have stronger practice effects than other tests and recommends study of such effects in the future. A related issue, which has been raised in the context of the study, is the PSI's predictive validity or the extent to which the PSI can predict later school achievement. Only one study to date has examined the predictive validity of the PSI,[10] and the Task Force considers its results far from conclusive.[11]

The second major cognitive test – the PPVT – was first published in 1959. The original version has been criticized as culturally biased, poorly conceptualized, subject to examiner effects on child performance, and as producing depressed scores for lower-income children.

Shipman and Tanaka[12] and Shipman[13] developed a modified version of the PPVT for Educational Testing Service in an effort to reduce obvious racial bias in the original instrument. The ETS adaptation of the first 60 items contained new versions of a number of the human pictures to present black children and adults in a variety of roles. Meissner et al used this version of the PPVT in the ETS Head Start Longitudinal Study.[14] Results of their work showed that the PPVT is best viewed as a measure of receptive vocabulary.

Meissner et al. urged that the test not be used in its original format, since many of the stimulus pictures are dated and are particularly inappropriate for minority children. The NDCS adopted the revised ETS version of the PPVT, it is not known to what extent racial bias was reduced by the revisions. A race effect was found in PPVT gain scores, and an adjusted gain was used in all analyses.

Improvements were made in the NDCS design and analytical techniques to mitigate the effects of cultural bias in the PSI and PPVT. First, the PSI and the PPVT were used to measure the *change* in children's cognitive development over a given period. The use of generalized gain score analysis* on raw cognitive scores was adopted in order to eliminate the effects of children's pretest characteristics (family background, socioeconomic status, etc.). This technique was sensitive to environmental influences during the interval between pre- and post-test and to center-to-center differences. The adjusted gain scores of the PSI and PPVT have proved to be largely independent of such background variables as race, sex and family income.

The adjusted gain scores varied systematically across centers, and this center-level variation was ultimately related to the study's major policy variables. Because change scores were analyzed at the center level and not on the child level, corresponding analysis of center-level "background" characteristics was conducted. Center averages of mother's education, family income, number of adults in the home, percentage of white children enrolled and a poverty index were explored. These factors – or covariables – were found to be unrelated to adjusted PSI and PPVT gains on the center level.

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* See Volume IV-C of the NDCS Final Report for a more detailed discussion of this technique.[15]

There is considerable evidence that situational factors – including the race of the tester – can affect black children's performance on standardized tests such as the PSI and PPVT.[16] This fact raises an additional concern about the reliability of standardized tests in assessing the cognitive development of black children tested by black and white testers in the day care setting.

The effect of the race of the tester on children's performance on the PSI and PPVT, then, was a major concern of the Task Force. Slight tester effects were found in raw scores from the first administration of the PSI and PPVT during Phase III. In the second round of Phase III testing, race of child and tester were matched as closely as possible. Subsequent analysis of adjusted PSI and PPVT adjusted gain scores showed that race of tester effects were nonexistent for the PSI and statistically insignificant for the PPVT.

Observation Instruments. The Task Force has consistently maintained that observation measures should play a role at least equal to that of the standardized tests in generating data on the effects of the NDCS policy variables. There is strong support in the literature for this strategy.[17]

The system selected for observing caregivers and the classroom environment, termed the Adult-Focus Instrument (AFI), had been used previously in evaluating the Follow Through and Head Start Planned Variation Projects. The instrument's coding system was modified for the NDCS to record adult behavior in day care centers. The instrument has three parts – the Physical Environment Inventory, which describes the space, equipment and materials in the classroom; the Classroom Snapshot, which records numbers of staff and children present in the classroom and the general configuration of their activities; and the Five-Minute Interaction, a continuous record of the behavior of a particular caregiver.

The Child-Focus Instrument (CFI) was used to record observed behaviors of the child during instructional free play, teacher-directed activity and an experimental situation. For the experimental situation, the CFI was slightly modified to focus on a limited number of behaviors assumed to be associated with the situation. Although the CFI, as conceptualized by Prescott,[18] was designed to measure the context and structure of the child's environment, it is used in the NDCS to measure behavioral traits of individual children, which are later aggregated to classroom and center levels for analysis. Such data are interpreted as measures of the day care climate or environment experienced by children in that classroom or center.

Race-of-observer effects noted by Abt Associates research staff during Phase II analysis raised questions about the reliability of the observation measures. The race-of-observer findings indicated that the pattern of coding observations of children and caregivers might have been different for black and white observers. NDCS staff decided that although the race-of-observer effects (first uncovered in the CFI) were small, each of the major dependent measures in Phase II (CFI, AFI, PSI, and PPVT) should be analyzed for similar effects.

In the final data collection effort for Phase III, the research design was altered to counter race-of-observer effects:

- Both children and caregivers were observed by bi-racial teams to mitigate the effect of observer bias; and
- Longer observations, by one black and one white observer, were conducted to provide tests of inter-rater agreement.

Analysis of Phase III data showed that these measures reduced race-of-observer effects. Although small and statistically insignificant observer effects were found, they do not jeopardize the reliability of the data. Observation data, like cognitive test scores, were aggregated and analyzed at the center level for Phase III analyses.

Analysis of Study Findings

The satisfactory resolution of many of the problems explained above was completed during the final data collection period and during the analyses of effects findings in Phase III. The following factors, in particular, influenced the Task Force's acceptance of NDCS findings:

- Adjustments made in data collection procedures and statistical analyses aimed at isolating test biases were used to eliminate cultural bias in the measures and their administration;
- Effects findings were based on *patterns* of behavior and outcomes for children and caregivers that reflected converging results on both observation and cognitive measures;
- Effects findings were analyzed on the *center level* not on the individual child or caregiver level; findings were not used to compare ethnic groups on any of the dimensions measured.

The policy implications of cost/effects findings, presented in Chapter Eight, are sensitive to the concerns of the black community. In particular, the Task Force endorses the statement that the fundamental criterion for evaluating alternative policy options is their effect on the well-being and development of children in federally subsidized care. Chapter Eight attempts to rule out policy options that are clearly inferior and presents for consideration feasible options for federal regulatory policy and administrative practice in the day care arena.

Several other policy considerations are also particularly relevant to the Task Force's concerns. Chapter Eight states that, *"If the federal government does not adopt a consistent, unambiguous and determined posture with respect to the objectives, content, interpretation and enforcement of federal day care purchasing regulations, major inequalities in the characteristics of day care services across states will persist."* Because black children are disproportionately represented in the federally subsidized day care population, they are undoubtedly affected by inequalities in the characteristics of day care services across states. A clear and consistent regulatory policy could assure that children receive day care comparable in quality regardless of where they live.

Although NDCS effects findings could not specify a caregiver specialization requirement, Chapter Eight concludes that research results were strong enough to suggest that such a provision be considered for future federal day care regulations. Specialized training in a child-related field clearly promotes better care for children. This finding is of major importance to black caregivers as well. A specialized training requirement and/or training program for federally subsidized day care would provide the opportunity for skilled and rewarding work for many low-income persons without academic credentials.

Black caregivers constitute a substantial proportion of all caregivers employed in federally subsidized day care centers (28 percent). The NDCS found that day care center staff are paid relatively low wages compared to workers with similar educational attainment and experience and that almost 30 percent of lead teachers and more than 45 percent of classroom aides in day care centers are paid wages less than or equal to the federal minimum wage. If any change with regard to wage rates is incorporated into future rate-setting efforts, it would seem appropriate to consider increases beyond simple cost-of-living raises. However, even payment of the minimum wage is not sufficient to lift most day care staff, many of whom are the primary or sole income-earners in their families, above the poverty threshold. Persons experienced and qualified to care for young children should receive adequate pay and sufficient incentive to improve their caregiving skills.

CONCLUSIONS/RECOMMENDATIONS

Both Abt Associates Inc. and ACYF have shown their awareness of the sensitive nature of social policy research. Their approach to the

NDCS has been marked not only by scientific objectivity and precision, but also by appropriate sensitivity to the human and political problems associated with carrying out a study involving multiethnic groups. They have responded reasonably to the concerns of minorities, especially the Task Force of the NDCS Consultant Panel.

Much of the concern expressed by the Task Force throughout the study focused on the use of standardized cognitive tests as a measure of day care effects. The consultants were apprehensive about whether such tests were valid and reliable measures of specified cognitive traits among black children. These concerns were significantly allayed by considering the test scores as only one element of a whole complex of data. Adjustments made in later phases of the data collection procedures, by statistical procedures aimed at isolating known test biases and, most importantly, by the appropriate use and interpretation of these test data in the NDCS also indicate NDCS responsiveness to these concerns.

Despite their limitations, standardized tests have proved very useful in addressing the study's major policy issues. Whether these tests are valid measures of individual cognitive ability, valid predictors of school achievement among black children, or whether they capture a large or narrow slice of a child's cognitive domain will remain contested issues. The test battery used in the NDCS represented adequate instruments for the purposes of the study.

Standardized tests were not considered measures of intelligence in the NDCS, nor were they used for the purpose of comparing ethnic groups on this dimension. Rather, aggregated at the class and center level, test scores were used to supplement observational data as indicators of day care program quality. The NDCS' standardized test data and observational data provide convergent conclusions about those patterns of center-based day care that seem to be most beneficial to children. For these reasons, the Task Force supports the use of effects findings based on NDCS instruments.

The process by which these conclusions were reached involved several major social research methodological and design precedents:

- The involvement of a culturally representative review body and research staff in the conduct of major social policy research;
- The use of observation measures as major indicators of day care program quality for young children;
- The adaptation of study design to address race-of-tester/observer effects in multiethnic research.

These steps should serve as models for future policy research efforts involving blacks and other minorities. Other issues identified by the Task Force have bearing on future policy research in the child development area:

- Future research efforts should be aware of and responsive to the need to identify and develop appropriate measures for the different populations studied, e.g., different ethnic and language groups. The practical requirements of implementing and completing large-scale studies too often dictates practical and immediate solutions to these problems.
- Further development of observation measures of young children's development should be pursued, including examination of reliability problems associated with observer bias.

Many blacks and other researchers fear that secondary analysis of NDCS effects findings for cross-ethnic comparisons could be misused or misinterpreted. As specific measures of cognitive and socioemotional development at the *child* level, there are sufficient questions of race and class bias in the PSI and PPVT, coupled with race-of-tester effects, to make the data suspect for valid cross-cultural comparisons.

Abt has responded to this concern by storing all individual child and staff racial identifiers on a separate computer tape, linked by code to the full data base. Requests for use of this tape by responsible researchers will be reviewed jointly by ACYF, Abt and the minority subcommittee of the Society for Research in Child Development. However, the Task Force recognizes that freedom of access to public data should not be unfairly restricted. All researchers should have equal opportunity to review and reanalyze NDCS data. The request process described above is intended only to safeguard against blatant misuse of data that were collected for a specific purpose. NDCS researchers feel a responsibility to the children, parents and center staff who participated in the study in good faith to promote knowledge and understanding of center day care.

APPENDIX A: DAY CARE CENTERS IN THE U.S.:
A National Profile 1976-1977

PART ONE: DAY CARE CENTER CHARACTERISTICS

Approximately 900,000 children are currently enrolled in day care centers in the U.S. The 18,300 centers they attend are quite diverse. Enrollments range from fewer than 15 children in the smallest centers to more than 300 children in the largest. Some centers offer extensive health and social services to children and families; others offer no supplementary services at all. Virtually all centers enroll three- and four-year-old children, but some centers also enroll infants and toddlers and offer before- and after-school programs for school-age children. Annual expenditures range from less than $600 per child to more than $3,600 per child.

Similarities and differences among centers are most easily understood by comparing the characteristics of different types of centers. In this report centers are classified by their legal status (profit or non-profit) and by whether or not they enroll publicly subsidized children (FFP* or non-FFP). This typology divides centers into four categories:

- Profit Non-FFP
- Non-Profit Non-FFP
- Profit FFP
- Non-Profit FFP

The profit FFP category is by far the smallest of the four, accounting for only 10 percent of U.S. centers (Figure 1). The other three categories are of roughly equal size, each accounting for one-quarter to one-third of all U.S. centers.

The four-way classification is useful in determining whether differences in center characteristics are more closely associated with differences in legal status or with the presence or absence of subsidized children. It should be *carefully* noted that comparisons are presented for descriptive purposes only. In addition to legal status and presence or absence of government subsidies, there are many other factors potentially responsible for differences among day care centers – community characteristics, the needs of children and

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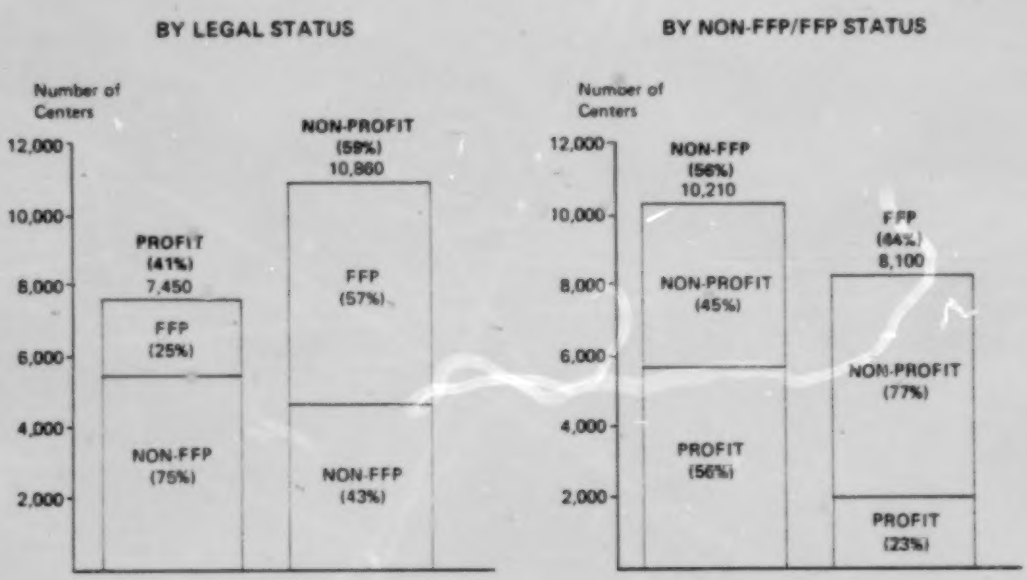
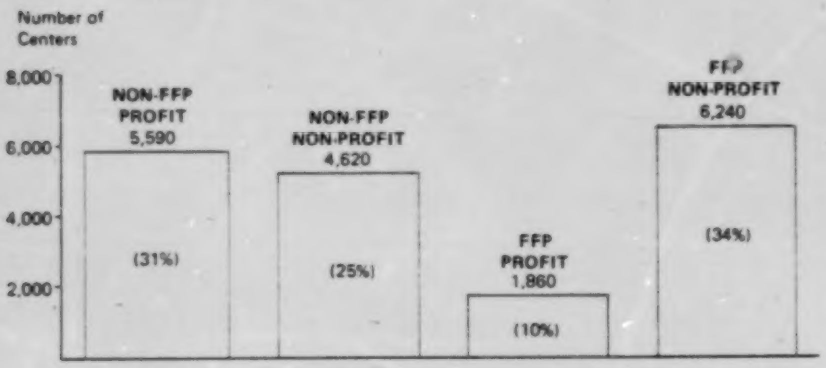
* The term FFP is used in this report to denote centers which have at least one child enrolled whose care is paid for, at least in part, by government funds. See Table 1 for definitions of this and other terms used in this chapter.

Figure 1: Distribution of Centers in the U.S.



BY LEGAL STATUS AND NON-FFP/FFP STATUS



families served, philosophy of center directors, differences in day care licensing regulations across states, etc. The differences in center characteristics that are reported here should not be interpreted as evidence that any one type of day care center provides day care services that are inherently less expensive or inherently better in quality than the services provided by other types of centers. Too many potential causal factors have been left unaccounted for in simple tabular presentations.

GENERAL CENTER CHARACTERISTICS

On the basis of current licensed capacities, existing day care centers have space to serve one million children (Table 2). Licensed capacity is set by state or local day care licensing offices and generally is determined by the number of square feet of usable floor space available at each center.* About 900,000 children are currently enrolled in day care centers, on either a part-time or full-time basis. Variations in hours in care between part-time and full-time children can be accounted for by converting enrollment to a full-time-equivalent

Table 2: Licensed Capacity, Enrollment and Utilization Rates

(Number of Children)

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers*
National Totals					
Licensed Capacity	273,200	284,000	102,600	347,100	1,006,900
Enrollment	238,500	251,700	91,400	316,200	897,700
FTE** Enrollment	214,500	212,900	82,100	282,000	791,500
Center Averages					
Licensed Capacity	49	62	55	56	55
Enrollment	43	55	49	51	49
FTE** Enrollment	38	46	44	45	43
Utilization Rate (%)**	78	77	82	84	80

* Totals may not equal sum of components due to rounding.

Reference: Tables 33, 37, 38, 40

** See Table 1, Chapter 1, for definition of terms.

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* State licensing codes generally require 35 square feet of usable indoor space and some amount of safe outdoor space per child. A few states require as little as 20 square feet or as much as 50 square feet per child. Local building codes sometimes override state licensing standards.

(FTE) basis.* FTE enrollment is currently 800,000 children. Since the average daily absence rate for children is 12 percent, FTE enrollment adjusted for absences is approximately 700,000.

The differences between licensed capacity (one million) and alternative measures of current enrollment (700,000-900,000) should not be taken as evidence that substantial excess capacity currently exists among day care centers. While there may be a number of specific communities in which excess capacity exists, natural constraints on day care centers often cause gross measures of excess capacity to be misleading. Day care centers tend to serve relatively small catchment areas. As a result, excess capacity in one community may exist side by side with shortages in neighboring areas. Due to transportation problems, parents in these neighboring communities cannot utilize the excess slots that exist 15 or 20 miles away. Another factor is equally important. As will be pointed out below, centers tend to arrange children in classrooms homogeneously by age. Centers may have several openings in classrooms for four- and five-year-olds but have to deny admission to two- and three-year-olds because their classrooms for younger children are filled. Because such natural constraints exist, accurate estimates of excess capacity can be determined only on a community-by-community basis.

The average day care center has a licensed capacity of 55 children, actually enrolls 49 children and has a full-time-equivalent enrollment of 43 children (Table 2). Profit non-FFP centers have the lowest average capacity and enrollment. Non-profit non-FFP centers are on average the largest centers, serving 30 percent more children per center than their profit non-FFP counterparts. Halfway between these two groups in terms of size are profit and non-profit FFP centers, both very similar in terms of average capacity and enrollment.

The ratio of FTE enrollment to capacity – the utilization rate – is a useful measure of the degree to which centers make use of the capacity they have available. FFP centers tend to be more fully utilized than non-FFP centers. FTE enrollment as a percentage of capacity is 77-78 percent among non-FFP centers versus 82-84 percent among FFP centers. Since low utilization rates are generally thought to reflect low cost efficiency, it is noteworthy that profit centers have slightly lower utilization rates than non-profit centers. As will be pointed out later, expenditure per child is significantly lower in profit centers than in non-profit centers. Either expenditure per child is not very sensitive to rate of utilization, or profit centers have found other more important mechanisms for controlling cost.

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* See Table 1 for definition of FTE enrollment. In this report 40 hours per week is used consistently as a definition of full-time-equivalent.

Day care centers appear to be very stable programs. Among currently operating centers, the average facility has been in operation for eight years (Table 3). One would suspect that such stability may not be characteristic of more informal child care arrangements* and therefore represents an important advantage of center-based care. There are no significant differences in average age across the four major types of centers.

Table 3: Age and Operating Schedules of Day Care Centers

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers
Years in Operation	8	8	7	7	8
Operating Schedules					
Percent Open 9 or More Hours Per Day	98	90	97	88	93
Percent Open 5 or More Days Per Week	100	99	100	99	99
Percent Open 49 or More Weeks Per Year	94	87	96	90	91

Reference: Tables 36, 42, 43, 44

Day care centers maintain daily, weekly and annual operating schedules that are consistent with the needs of working parents. Virtually all centers are open five or more days per week, and over 90 percent of all centers are open nine or more hours per day and 49 or more weeks per year (Table 3). As a group, non-profit centers are open fewer hours per day than profit centers, regardless of their FFP/non-FFP status. Even so, the differences are not very great. Nine hours per day is a reasonable minimum operating schedule, if parents must work eight hours and still have time to drop off their children in the morning and pick them up in the evening.

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* Family and group day care homes and care in the child's own home by a relative or non-relative are the most important alternatives to center-based care. Illness and population mobility among caregivers are likely to make such one-caregiver arrangements less stable than multiple-caregiver/specialized-facility day care centers.

CHILDREN AND FAMILIES

Of the children currently enrolled in day care centers, by far the predominant group is three-, four- and five-year-olds (Table 4). About half the children are three or four years old, and an additional 21 percent are five years old. The remaining children are split evenly between infant/toddlers and school-age children. The age composition of enrollment is relatively consistent across different types of centers. Profit centers tend to enroll a higher percentage of infants and toddlers than non-profit centers do, but the differences are relatively small.

Table 4: Age Composition of Enrollment

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers*
Children Enrolled by Age					
Two Years or Younger	42,700	33,700	13,800	31,600	121,800
Three Years	51,800	57,600	22,200	72,500	204,100
Four Years	62,300	74,800	25,300	95,300	257,600
Five Years	45,500	51,700	19,600	71,200	188,000
Six Years or Older	36,100	33,900	10,400	45,700	126,100
All Ages*	238,500	251,700	91,400	316,200	897,700
Percent Distribution by Age					
Two Years or Younger	18	13	15	10	14
Three Years	22	23	24	23	23
Four Years	26	30	28	30	29
Five Years	19	21	21	23	21
Six Years or Older	15	13	11	14	14
All Ages*	100	100	100	100	100

*Totals may not equal sum of components due to rounding.

Reference: Table 49

Minorities, especially blacks, account for a relatively high proportion of the children enrolled in centers. Twenty-eight percent of the children in centers are black, and 9 percent are of other minority groups (Table 5).* In contrast, minorities account for only 17 percent of the U.S. population under 15 years of age.**

Table 5: Racial Composition of Enrollment

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers*
Children Enrolled by Race					
White	193,800	167,700	67,700	139,400	568,500
Black	31,400	65,200	18,700	137,600	252,900
Other	13,400	18,800	5,000	39,200	76,200
All Races*	238,500	251,700	91,400	316,200	897,700
Percent Distribution by Race					
White	81	67	74	44	63
Black	13	26	21	44	28
Other	6	7	5	12	9
All Races	100	100	100	100	100

Reference: Tables 59-62

* Totals may not equal sum of components due to rounding.

The representation of minority children varies widely across different types of centers. Profit non-FFP centers have the lowest proportion of minority children enrolled, but, even so, minority representation is higher in these centers (19% of enrollment) than in the general day care-age population (17% of population). Non-profit FFP centers, by a wide margin, have the highest proportion of minority-group children enrolled. Over half of the children enrolled in non-profit FFP centers are non-white, compared to one-fifth to one-third of the children in other types of centers.

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* Tables 5 and 6 show slightly different percentages than do the referenced tables of the detailed statistical section, Part 2. This is because in each case the total numbers of children and families were divided by the total number of centers rather than averaging center means.

** U.S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 704, U.S. Government Printing Office, Washington, D.C., 1977, p. 28.

Single-parent families and low-income families constitute a high proportion of the families using center-based day care. Of U.S. families with children under 18 years of age, less than 20 percent are single-parent families and about half have incomes below $15,000 per year.* Of U.S. families with one or more children enrolled in day care centers, however, 38 percent are single-parent families and 73 percent have incomes below $15,000 per year (Table 6). Because data are not available on family income *and* family size for families using center-based day care, the percentage of such families with incomes below currently defined poverty

Table 6: Characteristics of Families Served

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers*
Single Parent Families					
Number	60,617	61,775	34,500	145,200	302,100
Percent of Total Families	25	30	41	53	[illegible]
Families Served by Income Status					
Below $6,000 per year	12,900	50,600	26,600	150,300	240,500
$6,000-$15,000	108,800	100,100	37,600	99,200	345,600
Above $15,000	118,300	57,200	20,200	22,700	218,300
All Families*	240,000	207,900	84,400	272,200	804,400
Percent Distribution by Income Status					
Below $6,000 per year	5	24	32	55	30
$6,000-$15,000	45	48	45	36	43
Above $15,000	49	28	24	8	27
All Families*	100	100	100	100	100

Reference: Tables 54-58

* Totals may not equal sum of components due to rounding.

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* Based on data in U.S. Bureau of the Census, *Current Population Reports*, Series P-23, No. 66, U.S. Government Printing Office, Washington, D.C., 1978, pp. 49-53. Median income of families with children in 1976 is approximately $15,000, based on a 1975 median income of $14,160 and a 6-percent inflation adjustment.

thresholds cannot be determined precisely. Nevertheless, it is likely that the poverty rate among families using center care is somewhere between 25 and 35 percent.*

The socioeconomic composition of families served varies widely across different types of centers, in much the same way as the racial composition of enrollment varies. The representation of single-parent families and low-income families is higher in all four types of centers than in the relevant portion of the general population. Between FFP and non-FFP centers and between profit and non-profit centers, however, the socioeconomic composition of families served is quite different. FFP centers, as a group, and non-profit centers, as a group, serve relatively high proportions of single-parent families and families with low incomes.

Non-profit FFP centers and profit non-FFP centers represent the two polar cases. At one extreme, over half the families served by non-profit FFP centers have incomes below $6,000 per year and less than 10 percent have incomes above $15,000. At the other extreme, only five percent of the families served by profit non-FFP centers have incomes below $6,000 and almost half have incomes above $15,000. Since profit non-FFP centers depend primarily on parent fees for their operating revenues, they can afford to provide only a limited number of slots to families unable to pay the full cost of day care.

PROGRAM CHARACTERISTICS

A number of center characteristics fall under the general heading of program characteristics. Perhaps the most important of these pertain to classroom structure – child/staff ratio,** number of children per classroom (class size) and the age composition of children in classrooms. Many centers offer important supplementary services – health examinations, developmental testing, transportation, family counseling and other social services. The degree of parental involvement in center activities is thought by some to be an important program characteristic. These program characteristics vary widely across different types of centers.

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* The current poverty threshold for a non-farm family of four is approximately $6,000 (Beverly L. Johnson, "Women Who Head Families," *Monthly Labor Review*, Vol. 101, February 1978, p. 37). Thirty percent of families using day care centers have incomes below $6,000, but due to variations in family size a slightly higher or lower percent may fall below the corresponding poverty threshold.

** In this report, the terms "staff/child ratio" and "child/staff ratio" are used interchangeably. All numerical estimates are reported, however, in terms of the ratio of children to adults. A staff/child ratio of 0.2 and a child/staff ratio of 5.0 are numerically equivalent, but the latter is somewhat easier to translate into counts of children and adults.

Classroom Structure

In recent years substantial attention has been focused on child/staff ratios in day care centers, for they are believed to be important determinants of both the quality and cost of day care. As will be discussed in detail in the next chapter, both state day care licensing standards and the Federal Interagency Day Care Requirements (FIDCR, applicable only to FFP centers) limit the maximum number of children that can be supervised by a single adult in day care centers. The average ceiling imposed by state licensing standards is 12.5 children per adult; the ceiling imposed on an average center by the FIDCR is 6.3 children per adult.* The wide discrepancy between federal and state standards is a major cause of the attention child/staff ratios have recently received.

There are a variety of ways one can calculate child/staff ratios for individual centers. The most important alternative computational procedures are discussed below in Chapter 3. The procedures used to derive the estimates presented in this chapter replicate as closely as possible the measurement procedures currently recommended by the Administration for Public Services, the agency within the U.S. Department of Health, Education, and Welfare with responsibility for interpreting federal day care requirements. The ratios reported here should reflect quite accurately the circumstances one would observe in day care center classrooms. Estimated ratios have been adjusted to reflect the number of hours full-time and part-time children are scheduled to be in centers, and they have been adjusted for prevailing absence rates of children. In addition, they take into account only those hours that day care center staff spend working directly with children. As a result, the estimates reported here should accurately measure contact-hour ratios between children and adults.

The average actual child/staff ratio for day care centers in the U.S. is 6.8 children per adult (Table 7). This average is very close to the average FIDCR standards for FFP centers (6.3 children per adult) and far below the average ceiling imposed by state licensing standards (12.5 children per adult). About one-third of centers maintain ratios of five or fewer children per adult, and about half maintain ratios of between 5:1 and 9:1. Only 20 percent of U.S. centers maintain ratios of more than nine children per adult.

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* Both of these figures are averages across all ages of children and have been carefully calculated to reflect the current age distribution of children enrolled in day care centers.

Table 7: Child/Staff Ratios*

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers
Average Child/Staff Ratio (Children per Caregiver)	7.9	7.3	7.3	5.5	6.8
Percent Distribution of Centers by Child/Staff Ratios					
5.0 or Fewer Children per Caregiver	17	27	24	50	32
5.1 to 9.1 Children per Caregiver	53	49	50	43	48
9.1 or More Children per Caregiver	30	24	26	6	20
All Centers	100	100	100	100	100

Reference: Table 78

* Child/staff ratios have been calculated by dividing total child-hours of care provided per week (adjusted for absences) by total number of hours adults work in the classroom per week. Such ratios pertain to the entire center and not to specific classrooms or age-groups of children.

Non-profit FFP centers assign significantly fewer children to individual caregivers, on average, than other types of centers. The average child/staff ratio in non-profit FFP centers is 5.5 children per adult. Half of these centers maintain ratios of five or fewer children per adult, and very few (six percent) maintain ratios of more than nine children per caregiver. The other three major types of centers – profit and non-profit non-FFP centers and profit FFP centers – maintain very similar child/staff ratios. Average ratios for these other three groups are 7.3 to 7.9 children per adult. Only one in four of these other centers maintain ratios of five or fewer children per adult, and a significant fraction (24-30 percent) maintain ratios of more than nine children per adult.

Although the difference in child/staff ratios between non-profit FFP centers and other types may appear small (about two children per caregiver), in fact, such a difference is quite important. Given the same number of classroom staff as a base, centers operating with ratios of 7.3-7.9 children per adult can serve 33-44 percent more children than centers operating with ratios of 5.5 children per adult. Since caregivers' salaries comprise a high percentage of centers' operating budgets, the potential effect of a two-children-per-caregiver difference on cost per child is quite large.

Class size in day care centers has not often received as much attention as class size in public schools.* Since most classrooms in

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* In this report, the terms "class size" and "group size" are used interchangeably to indicate the number of children per classroom.

Table 8: Size and Age Mix of Classroom Groups

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers
Mean Class Size for Children of Selected Ages*					
Two-Year-Olds	14	14	16	15	14
Three-Year-Olds	16	16	18	18	17
Four-Year-Olds	19	19	20	19	19
Five-Year-Olds	20	19	20	21	20
All Ages	17	18	19	19	18
Percent Distribution of Classrooms by Age Range of Children**					
Less than Two Years	77	84	74	80	80
Two Years or More***	23	16	26	20	20
All Classrooms	100	100	100	100	100

Reference: Table 72

* Average number of children per classroom; data reflect grouping patterns during morning hours.

** Age range is the difference in age between the oldest and youngest child in the classroom.

*** Since the ages of children were recorded in one year intervals, a classroom containing older three-year-olds, four-year-olds and younger five-year-olds would be recorded as having an age range of two years or more, even though the actual age range is only slightly more than one year.

non-profit centers and somewhat lower in non-FFP centers than in FFP centers. Across all types of centers, however, the frequency and degree of age-mixing are low.

Supplementary Services

Child/staff ratio, class size and age composition of children in classrooms are characteristics of the basic service all day care centers provide – care and supervision of children. Many day care centers, especially those serving children from low-income families, offer more than this basic day care service. Supplementary services include health examinations and developmental testing of children, family counseling and other social services to parents. Virtually all centers provide some form of meal or snack to children, but some centers provide extensive food service, enough to satisfy the child's basic daily nutritional requirements. Transportation should also be counted as a supplementary service, for it is provided by a minority of centers.

In assessing the services provided by day care centers, it is useful to know not only what services are provided but also how many children or families are receiving each type of service, how frequently the service is provided, and whether or not the service is public schools are supervised by a single adult, class size and child/staff ratio in public schools are one and the same issue. In day care centers, however, two or more adults are generally assigned to a single classroom.[*] The frequency of multiple-caregiver classrooms has separated class size from the controversy surrounding child/staff ratio. Only recently has research evidence become available on the important effects of class size on the cognitive development of children and on the classroom interactions among children and between children and caregivers.[**] These findings are likely to make class size in day care centers a much more important issue in the future.

Federal day care regulations (applicable to FFP centers) and many state day care licensing codes limit the number of children that day care centers can place in a single classroom. Most regulations differentiate maximum allowable class size by the age of the children in the room. The FIDCR, for example, specify 15 children as a maximum for classrooms containing three-year-olds, 20 as a limit for four- and five-year-olds, and 25 as a limit for groups of older children. Most day care centers do differentiate class sizes according to the age of children; average class size is 14 children for two-year-olds, 17 children for three-year-olds, 19 for four-year-olds, and 20 for five-year-olds (Table 8). Average class size in FFP centers is slightly higher than average class size in non-FFP centers, for each age group of children. More important, average class size in FFP centers is very near or *above* the maximum limits set by the FIDCR. For a significant number of children in FFP centers currently established class sizes do not meet federal regulations.[§]

When children enter public school they are placed in age-homogeneous classrooms. The same appears to hold in day care centers. In 80-90 percent[§§] of the day care center classrooms, the age range of children is less than two years (Table 8). The frequency of age-mixed classrooms is somewhat higher in profit centers than in paid for by the center. In the case of most services, data are available for only the percentage of centers providing each service. Measures of coverage, frequency and source of payment are not available. In addition, the term "provides" is somewhat ambiguous. In the case of medical examinations for children, for example, centers which employ a nurse (or pay a doctor) to provide examinations at the center are counted as providing examinations, but so are centers that arrange appointments for children at a local public health service clinic. These facts should be kept in mind in interpreting the data on service provision presented in this report.

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[*] No survey data are available which measure directly the frequency of multiple-caregiver classrooms. However, the average number of children per classroom is nearly three times higher than the average child/staff ratio. This suggests that the average classroom has two or three adults in caregiver roles.

[**] See Travers, J., Ruopp, R., et al, *National Day Care Study: Preliminary Findings and Their Implications*, Abt Associates Inc. (Cambridge, MA. January 1978, pp. 12-14).

[§] The FIDCR set no limits on group size for children under three years of age. Almost one half (46.4%) of the three-year-olds in FFP centers and almost one third (30.9%) of the four- and five-year-olds are in classrooms containing more than the FIDCR-allowed maximums (15 for three-year-olds, 20 for four- and five-year-olds).

[§§] See the last footnote on Table 8 for an explanation of why a precise estimate of age range cannot be given.

A substantial number of centers provide health-related examinations and developmental testing to children. Hearing, speech or vision examinations are provided by two out of every three centers (Table 9). Half of all centers provide psychological or developmental tests for children. One out of every three centers provides physical examinations,* and a similar fraction provide dental examinations.

Table 9: Services Provided to Children and Families by Type of Center

(Percentage of Centers)

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers
Services to Children*					
Physical Exams	13	28	23	55	32
Dental Exams	11	28	20	57	32
Hearing, Speech or Vision Exams	47	62	60	82	64
Psychological or Developmental Testing	32	45	43	72	50
Services to Parents*					
Counseling on Child's Development	79	84	83	94	86
Counseling on Family Problems	36	53	46	77	55
Assistance in Obtaining Food Stamps or Financial Aid	19	36	45	74	45
Assistance in Obtaining Community Services	30	44	45	79	52

Reference: Tables 66, 68

* The data reflect the percent of centers reporting provision of a service; they do not indicate the level or frequency with which a service is provided.

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* Approximately 90 percent of centers require that children have physical examinations at the time they enroll.

For each of these services, the lowest percentage of centers providing a service is found among profit non-FFP centers, and the highest percentage is found among non-profit FFP centers. The differences between the two groups of centers are quite large. Children in non-profit FFP centers have two to three times as high a probability of receiving each type of service as children in profit non-FFP centers.

Variations across centers in the services offered to parents seem to be consistent with variations in the income status of families served (cf. Table 6 and Table 9). A high percentage (79-94%) of centers of each major type provide counseling to parents on their child's development. One would expect such parent conferences to be a basic service offered by all centers, regardless of the socio-economic status of families. The percentage of centers offering other services to parents is quite different across different types of centers. Counseling on family problems and assistance in obtaining food stamps, financial aid and community services are clearly not basic components of day care programs but may be very important to the overall well-being of children. These latter services are provided by three-quarters or more of non-profit FFP centers but by only one-fifth to one-third of profit non-FFP centers. These are the two groups of centers for which differences in the income status of families served are most dramatic.* Large differences in provision of social services between the two groups are therefore not surprising.

About one out of every three centers provides transportation for children, but only 17 percent of children actually receive transportation (Table 10). The difference between these two percentages is expected, for not all children in a center would need transportation. The percent of centers providing transportation and the percent of children receiving it are about twice as high among FFP centers as among non-FFP centers.

Table 10: Transportation Provided for Children

	Non-FFP Centers		FFP Centers		All Centers
	Profit	Non-Profit	Profit	Non-Profit	
Percent of Centers Providing Transportation	26	21	43	42	32
Percent of Children Transported	9	11	20	26	17

Reference: Table 68

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* About half the families served by profit non-FFP centers are above the median income level for families with children, and 95 percent of the families served have incomes above the poverty threshold for a family of four. For non-profit FFP centers, the income distribution of families served is almost exactly the reverse.

Almost all centers (90-98%) provide lunch and/or an afternoon snack for children, and 80 percent provide a morning snack (Table 11). Dinner and evening snacks are relatively rare, for most day care centers are not open beyond the dinner hour. The one significant difference in food service across different types of centers is the percentage of centers providing breakfast. About 70 percent of non-profit FFP centers provide breakfast,* about twice the percentage found among other types of centers.

Table 11: Meals and Snacks Provided

(Percentage of Centers)

Meals/Snack Provided	Non-FFP Centers		FFP Centers		All Centers
	Profit	Non-Profit	Profit	Non-Profit	
Breakfast	30	41	38	69	47
Morning Snack	68	81	86	71	80
Lunch	90	91	94	97	93
Afternoon Snack	97	94	98	97	96
Dinner	4	2	8	1	3
Evening Snack	3	2	3	5	3

Reference: Table 67

It is somewhat surprising to find such small differences between profit and non-profit centers in terms of the scope of meal service provided. Non-profit centers are eligible for reimbursement for meals and snacks served under the Department of Agriculture's Child Care Food Program (CCFP): profit centers are not. The availability of reimbursement to profit centers should provide a differential incentive to provide a complete meal service.** Since data are not available on the nutritional content of meals and snacks, it is not possible to assess the impact of CCFP in a thorough fashion.

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* It appears that some non-profit FFP centers serve breakfast in place of a morning snack.

** Reimbursement rates set by the food program are dependent upon the income distribution of families served. Only for families near or below the poverty thresholds do reimbursement rates cover the full cost of food service. Only 57 percent of eligible centers have elected to participate in the program.

The nature and frequency of parent participation in center activities varies widely by type of center (Table 12). The types of parental activities (roles) for which data are available are the following:

- serve as volunteers (28% of centers);
- participate in staff selection (23% of centers);
- review programs and budgets (35% of centers);
- participate in fund-raising (33% of centers); and
- use centers for social activities (36% of centers).

In three out of every five centers parents participate in at least one of these ways. The frequency of parent participation is much lower among profit centers than among non-profit centers and much higher for each type of FFP center than for the corresponding type of non-FFP center.

Table 12: Parent Participation in Center Activities

(Percentage of Centers)

Role of Parents	Non-FFP Centers		FFP Centers		All Centers
	Profit	Non-Profit	Profit	Non-Profit	
Serve as Volunteers	12	29	16	45	28
Participate in Staff Selection	3	22	8	45	23
Review Programs and Budgets	12	36	17	61	35
Fund-Raising	6	38	11	59	33
Use Center for Social Activities	12	40	23	58	36
Do Not Participate in Any of These Five Ways	68	36	56	16	41

Reference: Table 69

STAFF CHARACTERISTICS

There are 194,800 persons working in day care centers in the U.S. (Table 13). Of these, 158,500 are paid by centers and an additional 9,700 are paid by outside agencies (e.g., CETA*). The remaining

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* Comprehensive Employment and Training Act program; funded by the U.S. Department of Labor.

Table 13: Number and Type of Center Staff

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers
National Totals					
Paid by Center	33,500	42,500	14,400	68,000	158,500
Paid by Outside Agency	0	2,100	200	7,400	9,700
Volunteers	2,500	6,600	1,500	16,000	26,700
Total Staff	36,100	51,400	16,100	91,300	194,800
Classroom Staff*	30,800	39,200	13,800	64,900	148,800
FTE Classroom Staff	23,500	27,300	10,200	48,000	108,900
Center Averages					
Total Staff	6	11	9	15	11
Staff Paid by Center	6	9	8	11	9
Classroom Staff	6	8	7	10	8
FTE Classroom Staff	4	6	6	8	6

Reference: Tables 83-87

* Classroom staff are those staff persons who spend some time each week working directly with children, including volunteers and staff paid by outside agencies.

26,700 staff are volunteers. Since day care centers account for only 168,200 of the 88 million* paid civilian employees in the U.S., centers provide only two-tenths of one percent of U.S. employment opportunities.

About 148,800 staff-persons, both paid and unpaid, spend some time each week working directly with children. Thus 74 percent of the 194,800 center personnel serve at least part time as caregivers. Converted to 40-hour-week equivalents, total hours spent in the classroom by all caregivers represent 108,900 full-time equivalent positions. The difference between the number of caregivers (148,800) and the number of FTE caregivers (108,900) is large – suggesting that many classroom staff work only part-time and other classroom staff work full-time but spend some of their time on non-caregiver responsibilities.**

The average center has eleven staff, of which nine are paid by the center and two are either volunteers or paid by outside agencies. Of the eleven staff, eight spend some time each week working with children and the remaining three have no caregiver responsibilities. Non-caregivers serve as cooks, custodians, secretary/bookkeepers, bus drivers, professional specialists (e.g., social workers or nurses) or general administrators (e.g., directors or program coordinators).

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* U.S. Department of Labor, *Monthly Labor Review*, Vol. 100, June 1977, p. 76.

** The average caregiver spends more than 90 percent of her or his working hours in the classroom, so part-time work schedules are the major cause of the large difference between number of caregivers and number of FTE caregivers.

On average, FFP centers have more staff than non-FFP centers, but by far the largest differences occur between profit and non-profit centers. The average non-profit center has more total staff, more paid staff, more volunteer staff, more classroom staff and more non-classroom staff than the average profit center. Only a part of the variation in number of staff across centers can be accounted for in terms of number of children enrolled. Non-profit FFP centers, for example, are about 20 percent larger than profit non-FFP centers in terms of enrollment (c.f. Table 2) but are 60 to 100 percent larger in terms of total staff, paid staff and classroom staff. A part of the difference in total staff between profit and non-profit centers is accounted for by volunteers and staff paid by outside agencies – types of personnel to which non-profit centers have inherently easier access.

Many day care centers have professional specialists on their staff, but many others apparently obtain the services of such specialists from community agencies or on a consulting basis. This observation is based on a comparison of the percentage of centers providing professional services (Table 9) with the percentage of centers having corresponding professional specialists on their staff (Table 14).

Table 14: Use of Selected Types of Professional Staff

	(Percentage of Centers)				
	Non-FFP Centers		FFP Centers		
Type of Professional*	Profit	Non-Profit	Profit	Non-Profit	All Centers
Hearing, Speech or Vision Specialist	4	8	6	11	8
Social Worker	6	20	9	30	21
Nurse	14	23	19	32	23
Psychologist	4	9	4	11	8
Child Development Specialist	23	31	30	48	35

Reference: Table 92

* Data indicate only the presence or absence of a staff specialist, not the intensity or frequency of services they provide to children.

Sixteen out of every twenty-five centers provide hearing, speech or vision testing to children, but only two out of twenty-five have a hearing, speech or vision specialist on staff. Fifty percent of centers provide psychological or developmental testing to children, but only eight percent have a staff psychologist, and only 35 percent have a "child development specialist" on staff. One-third of centers provide physical and/or dental examinations to children, but only 23 percent have a staff nurse. More than half of all centers provide social services to parents (counseling and/or assistance in obtaining welfare services), but only one-fifth have a staff social worker. Staff professional specialists are found most frequently at non-profit FFP centers. Even among centers of this type, however, the frequency of professional services being provided is much higher than the frequency of staff professional specialists.

Classroom staff in day care centers are relatively young, and virtually all are female (Table 15). Two out of every three caregivers on average are between the ages of 18 and 35. Relatively few are under 18 years of age (7 percent) or over 50 (8 percent). FFP centers tend to employ a higher fraction of caregivers under the age of 26 than do non-FFP centers. For the most part, however, the age and sex distribution of classroom staff is very similar across the four major types of centers.

Table 15: Age, Sex and Race of Classroom Staff

(Percent of Caregivers)

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers
Percent Distribution by Age:					
Younger Than 18 Years	5	7	5	7	7
18 to 25 Years	33	30	47	35	34
26 to 35 Years	32	31	29	33	32
36 to 49 Years	20	21	14	18	19
50 Years and Older	9	11	5	7	8
All Ages*	100	100	100	100	100
Percent Distribution by Sex:					
Male	5	4	8	8	6
Female	95	96	92	92	94
Percent Distribution by Race:					
White	84	73	76	50	66
Black	12	23	20	39	28
Other	3	5	4	10	7

Reference: Tables 108, 110

* Totals may not equal sum of components due to rounding.

The racial distribution of classroom staff is virtually identical to the racial distribution of enrollment (c.f. Tables 5 and 15). Sixty-six percent of caregivers are white, 28 percent are black and 7 percent are members of other minority groups. For enrollment the corresponding percentages are 63, 28 and 9, respectively. Among non-profit FFP centers both caregivers and children are split almost equally between whites and non-whites. The proportion of minority caregivers and children is significantly lower among other types of centers but close to or above the proportion of minorities in the general population.

The educational attainment of classroom staff in day care centers is relatively high (Table 16). Twenty-nine percent of care givers have 16 or more years of formal education – twice the percentage among all employed females in the U.S.* Fifty-four percent of caregivers have some post-secondary education – more than twice the percentage among all employed females. Only one in ten caregivers has not completed high school, compared to about one in four among female employees elsewhere. Directors gener-

Table 16: Educational Attainment of Classroom Staff

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers
Percent Distribution of Classroom Staff by Years of Education:					
Fewer Than 12 Years	9	10	8	11	10
12 Years	38	34	36	34	35
13 to 15 Years	26	24	29	25	25
16 Years or More	28	31	28	30	29
All Caregivers*	100	100	100	100	100
Mean Years of Education:					
Classroom Staff	14	14	14	14	14
Directors	14	15	15	16	15
Percent Classroom Staff Receiving In-Service Training**	50	61	59	73	62

Reference: Tables 99, 102, 112

* Totals may not equal sum of components due to rounding.

** Percentage of classroom staff that have taken courses, seminars or in-service training programs related to day care in the last year.

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* Since 94 percent of caregivers are female, the relevant population for comparison is employed females. Data on educational attainment in the general population are from Kopp Michelotti, "Educational Attainment of Workers, March 1977," *Monthly Labor Review*, Vol. 100, December 1977, p. 54.

ally have completed more years of formal education than classroom staff, but in terms of averages, the difference is only one or two years.*

A substantial proportion of caregivers participate in some form of educational or training program while they work. Sixty-two percent have taken courses, seminars or in-service training programs within the last twelve months. Participation rates are highest among caregivers in non-profit FFP centers and lowest for profit non-FFP centers. Even in the latter type of center, however, half of all classroom staff have participated in some educational/training program within the last year.

In addition to their relatively high educational attainment, day care center staff have an appreciable amount of job-related experience (Table 17). Mean previous day care experience is four years for classroom staff and nine years for directors. Thirty-two percent of caregivers have fewer than two years of previous day care experience, and 27 percent have worked in day care related jobs for six years or more. The proportion of caregivers with limited

Table 17: Previous Day Care Experience of Classroom Staff

	Non-FFP Centers		FFP Centers		All Centers
	Profit	Non-Profit	Profit	Non-Profit	
Percent Distribution of Classroom Staff by Years of Experience:					
Fewer Than 2 Years	27	31	31	35	32
2 to 5 Years	41	40	43	40	41
5.1 to 10 Years	23	24	19	22	22
10.1 Years or More	9	5	7	3	5
All Classroom Staff*	100	100	100	100	100
Mean Years of Experience:					
Classroom Staff	5	4	4	4	4
Directors	10	8	8	8	9
Turnover Rate of Classroom Staff (%)*	17	15	20	13	15

* Percentage of classroom staff positions that have been refilled at least once in the last year.

Reference: Table 106

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* Data from the on-site follow-up survey indicate that teachers and lead-teachers in day care centers have substantially more education than classroom aides. For example, more than 30 percent of teachers and lead-teachers have completed four years of college – compared to only five percent of aides.

previous day care experience (fewer than three years) is highest in non-profit FFP centers (35%) and lowest in profit non-FFP centers (27%).

Turnover rates among classroom staff are relatively low and quite similar across different types of centers. Only 15 percent of classroom staff positions have been vacated and refilled within the last year. Of the eight classroom staff in the average center, therefore, only one is likely to be a new staff person each year. This fact suggests that the potential for stable caregiver/child relationships over the course of the year is very high.

FINANCIAL CHARACTERISTICS

The combined operating expenditures of all U.S. day care centers amount to about $1.3 billion per year (Table 18). This sum includes expenditures for wages, salaries and fringe benefits for center per-

Table 18: Annual Operating Expenditures

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers
Total Expenditures (millions of $)	258.7	297.2	114.4	616.1	1,286.3
Center Averages					
Personnel	27,200	47,000	36,200	72,000	48,400
Supplies	8,600	10,100	9.800	12,800	10,600
Occupancy	7,700	4,200	9,000	6,700	6,600
Other	2,800	3,100	6,600	7,200	4,700
Total*	46,300	64,400	61,600	98,700	70,300
Percent Allocation, Center Averages**					
Personnel	63	73	61	73	69
Supplies	18	17	16	14	16
Occupancy	15	7	15	7	10
Other	5	4	8	6	5
Total	100	100	100	100	100

Reference: Tables 119, 120, 122

* Totals may not equal sum of components due to rounding.

** These percentages have been calculated by averaging percentages across centers (e.g., average of percent of expenditures allocated to personnel). They will differ slightly from percentages calculated by dividing average expenditures in a category by average total expenditures.

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sonnel, expenditures for food, housekeeping materials and other supplies, expenditures for rent, mortgage, taxes and other occupancy items, plus miscellaneous expenditures – for contracted services, insurance, etc. The $1.3 billion estimate does not include an imputed value of volunteer labor and donated materials, space and service.*

Average Expenditures

The typical day care center has an annual operating budget of $70,300. More than two-thirds of the total ($48,400) is allocated to personnel expenditures. Purchase of supplies accounts for about one-sixth ($10,600) of the average budget; occupancy expenditures ($6,600) and miscellaneous expenditures ($4,700) account for the remainder.

Expenditure patterns vary widely across different types of centers. Average expenditures in profit non-FFP centers, for example are $46,300 per year – less than half the $98,700 spent annually by the average non-profit FFP center. About 85 percent of the difference between the average budgets of these two types of centers is due to a very large differential in average personnel expenditures ($27,200 vs. $72,000). In general, non-profit centers allocate a relatively high fraction of their budgets to personnel (73% vs. 61-63% in profit centers) and a relatively low percentage to occupancy expense (7% vs. 15% for profit centers). FFP centers generally have larger budgets and tend to spend more dollars in each budget category than corresponding types of non-FFP centers. When centers of the same legal status (profit/non-profit) are compared, however, the *percentage* allocation of expenditures across categories within the budget is about the same in FFP centers as in non-FFP centers.

Annual expenditures per full-time-equivalent (FTE) child, averaged across all day care centers in the U.S., is $1,630 (Table 19). In contrast, average annual expenditures per pupil in public elementary and secondary schools in the U.S. is about $1,480.** This comparison is helpful in placing day care cost in perspective – day care is not an inexpensive service. The comparison of expenditure per child in day care centers and in public schools must be used cautiously, however, for the average length of the school term is only about 36 weeks,* compared to the 51 weeks per year the average day care center is open. School costs for a day-care-equivalent year would exceed $2,000.

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* The term expenditure is used here to denote "cash" outlays by day care centers. The term cost denotes the value of all resources used by centers, including the value of donated space, labor and materials. Donated resources and day care cost are discussed below.

** National Center for Eduation Statistics, U.S. Department of Health, Education, and Welfare, *Statistics of Public Elementary and Secondary Day Schools*, U.S. Government Printing Office, 1977, p. 44. Estimate is for the 1976-77 school year and represents per pupil expenditures, unadjusted for absences.

In terms of *average* expenditures per FTE child, non-profit FFP centers are clearly the most expensive day care program ($2,190 per child per year), and profit non-FFP centers are clearly the least expensive programs ($1,230 per child per year). Non-profit non-FFP centers and profit FFP centers (both $1,430 per child per year) fall between the two extremes, but below the middle of the cost spectrum.

Table 19: Expenditures per Child

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers
Average Annual Expenditures Per Child	1,230	1,430	1,430	2,190	1,630
Percentage Distribution of Centers by Annual Expenditures Per FTE Child					
Less than $1,000	41	32	19	9	26
$1,000 to $1,999	53	50	68	39	49
$2,000 to $2,999	5	11	10	33	17
$3,000 or More	2	6	3	19	9
All Centers*	100	100	100	100	100

* Totals may not equal sum of components due to rounding.

Reference: Table 121

Averages tend to mask substantial variation in expenditures among centers of a given type. Among non-profit FFP centers, for example, nine percent of centers spend less than $1,000 per year per child, and 19 percent spend more than $3,000 per year per child. Among profit non-FFP centers, the least expensive programs of the four major types, 41 percent spend less than $1,000 per year per child, but a small number of centers (2%) spend more than $3,000 per child per year. These within-type variations are important, for they demonstrate the validity of a statement made at the outset of this chapter: Regardless of profit/non-profit status or FFP/non-FFP status, no one type of center is *inherently* more or less expensive than other types of centers. Variations in services provided, staff/child ratios and salary scales across different types of centers are quite large, and these variations are likely to be the most important causes of differentials in expenditures per child.

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* Bureau of the Census, U.S. Department of Commerce, *Statistical Abstract of the United States*, U.S. Government Printing Office, 1974, p. 122. Data are for the 1972-73 school year.

Sources of Revenue

Differences across centers in the relative importance of government revenue and parent fees are obviously related to differences in the number of subsidized and non-subsidized children enrolled (c.f. Tables 20 and 21). Profit non-FFP centers rely almost exclusively

Table 20: Sources of Revenue

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers
Average Percent Distribution of Revenue					
Parent Fees	100	90	72	26	70
Government	0	8	27	71	29
Cash Contributions	0	3	0	3	2
All Sources*	100	100	100	100	100

* Totals may not equal sum of components due to rounding.

Reference: Table 125

Table 21: Distribution of Enrollment by Source of Payment

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers
Number of Children Whose Care is Paid For By:					
Parent Fees	236,000	208,700	65,700	98,900	609,400
Government Funds	0	0	24,700	201,000	225,700
Other Sources*	2,500	43,000	900	16,300	62,700
All Children**	238,500	251,700	91,400	316,200	897,700
Percent of Enrollment Paid For By:					
Parent Fees	99	83	72	31	68
Government Funds	0	0	27	64	25
Other Sources*	1	17	1	5	7
All Sources**	100	100	100	100	100

Reference: Table 136

* Scholarships and contribution or fees from charitable organizations.

** Totals may not equal sum of components due to rounding.

on parent fees as a source of income, and virtually all of the children they enroll are paid for by parent fees. Only one percent of the children in these centers are on scholarship, have their fees paid by charitable organizations or are receiving free care because their parents work at the centers they attend. Non-profit non-FFP centers rely heavily on parent fees (90% of income) and enroll a high percentage of parent-fee children (83% of average enrollment). Non-profit non-FFP centers do receive some cash contributions (3% of income) and some revenue from government (8% of income), largely from the U.S. Department of Agriculture's Child Care Food Program (CCFP). Income from these non-parent-fee sources allow non-profit non-FFP centers to enroll 43,000 children (17% of enrollment) whose care is paid for by neither parent fees nor government day care reimbursement.

In profit FFP centers, the percentage distribution of income and the percentage distribution of enrollment are virtually the same – 72 percent of income and enrollment is paid by parent fees, and 27 percent of income and enrollment is paid by government day care reimbursement. In non-profit FFP centers income from government is by far the most important source of revenue (71%), and subsidized children comprise a high percentage (64%) of average enrollment. Over 30 percent of the children in non-profit FFP centers, however, are paid for by parent fees. Non-profit FFP centers therefore are not exclusively serving FFP children.

The percentage of revenue derived from parent fees is highest (virtually 100%) in the lowest cost centers (non-FFP profit). The percentage of revenue derived from government sources is highest (71%) in the highest cost centers (FFP non-profit). These differentials in cost and the relative importance of different sources of income must be considered in estimating total annual income derived from parents, government and cash contributions. If the percentage distribution of income by source (Table 20) is applied to estimates of total annual expenditure (Table 18) for each of the four major center types, rough estimates* of the distribution of total annual center income can be derived. Parents pay about $750 million for center-based day care services per year (some of which is ultimately returned in the form of child care tax deductions). Government sources – federal, state and local day care reimbursement plus Head Start and CCFP funds – provide approximately $500 million per year. Cash contributions amount to approximately $20-30 million per year.

Nationally, 68 percent of the children enrolled in day care centers have their day care paid for by parent fees. Since 70 percent of the families utilizing center-based day care have incomes of $6,000 or more per year (Table 6), it would appear that virtually all families with incomes of $6,000 or above are paying for day care services out of family income. About 60 percent of these families have incomes between $6,000 and $15,000 per year, and in this income group the fees paid for day care may consume 10 percent or more of the family budget.

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* Telephone survey data can be used to estimate the percentage distribution but not the absolute dollar amount of income derived from various sources. The estimates provided here are based on the assumption that income and expenditures are approximately equal.

Average Fees and Fee Differentials

Day care centers frequently charge different rates for day care services for different children. The most important determinants of the rates charged for specific children are the following:

- *Source of payment* – whether the child's care is paid for by parents or government agencies;
- *Hours per week* the child is in the center;
- *Families' financial circumstances,* in the case of parent fees;
- *Age of the child;* higher rates are sometimes charged for care of very young children (infants/toddlers) and lower rates for school-age children, because of differences in required staff/child ratios for children of different ages.

All of the estimates presented here pertain to rates charged for full-time children.* Estimates are provided of the highest rate charged for any full-time child (maximum fee) and the lowest rate charged for any full-time child (minimum fee). Maximum and minimum fees paid by parents and maximum and minimum rates paid by welfare agencies are reported separately (Table 22).

The maximum fee that a center establishes for full-time children is generally the standard fee, charged for most of the full-time care provided by the center. Across all centers which charge parent fees, the maximum fee paid by parents is $26 per week on average – or about $1,350 for 52 weeks of care per year. Across all centers which receive reimbursement from welfare agencies, the maximum fee paid by welfare departments is $31 per week on average ($1,610 per 52-week year). These two averages have been calculated from different samples – the former from centers which receive parent

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* A full-time child is defined as one enrolled in a center for 30 hours or more per week. Among children enrolled 30 hours or more, the average number of hours per week in the center is 40.

Table 22: Average Weekly Fees

Average Weekly Fees for Full-Time Children	Non-FFP Centers Profit	Non-FFP Centers Non-Profit	FFP Centers Profit	FFP Centers Non-Profit	All Centers
Parent Fees					
Maximum	25	24	27	26	26
Minimum	21	19	24	17	19
Welfare Fees					
Maximum	NR	NR	27	32	31
Minimum	NR	NR	25	29	28

Reference: Tables 127-130

NR: Not relevant; non-FFP centers have no children whose care is paid for by government funds.

Note. Centers often charge different fees for different children – due to differences in families' ability to pay or to differences in age of child. Maximum fee is, for most centers, the standard fee; minimum fee is the lowest fee charged for any full-time child.

fees, the latter from centers which receive welfare reimbursement.* Nevertheless, the $5 differential per child per week between average parent fees and average welfare fees does reflect differences in expenditures per child between centers which receive parent fees and centers which receive welfare reimbursement (the correlation between fees and expenditures per child is discussed below).

Approximately half the centers which receive fees from parents establish differentials in the rates charged to parents per full-time child (Table 23). Most frequently the differentials are based on one or more factors which determine the ability of families to pay the full cost of day care services:

- *Family Income* – 24 percent of centers charge lower fees to families with low incomes;
- *Total Family Size* – 38 percent charge lower fees per child to large families;
- *Multiple Enrollment* – 19 percent of centers charge lower rates per child to families with two or more children enrolled in center.

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* In some states welfare departments will not reimburse at a higher rate than the basic rate charged to parents. Because average parent fees and average welfare reimbursement rates have been calculated from different samples, the data in Table 22 cannot be used to determine differentials between parent fees and welfare rates within the same centers. Some of the centers in the survey did receive both parent fees and welfare reimbursement. In 70 percent of these centers maximum welfare rates were less than or equal to maximum rates charged to parents. It is quite possible that in many of the centers in which welfare rates exceed parent fees, parents are paying only partial day care costs under a sliding fee arrangement.

Table 23: Fee Differentials

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers
Parent Fees					
Percent of Centers Charging Differential Fees	47	51	41	59	52
Percent of Centers with Differentials Based on:					
– Family Income	8	20	10	45	24
– Multiple Enrollment*	7	15	11	35	19
– Family Size	37	37	32	41	38
– Age of Child	19	15	16	9	14
Welfare Fees					
Percent of Centers Receiving Differential Fees	NR	NR	20	24	23**
Percent of Centers with Differentials Based on Age of Child	NR	NR	8	5	6**

Reference: Table 131

NR: not relevant; no welfare fees in non-FFP centers.

* More than one child enrolled from same family.

** Percent of FFP centers.

In addition, 14 percent of centers charge differential rates to parents on the basis of the age of the child being cared for.

The degree to which fees are differentiated on the basis of the age of the child is an important issue. State licensing regulations and the Federal Interagency Day Care Requirements (FIDCR, applicable only to FFP centers) require more adult supervision in classrooms of very young children and less adult supervision in classrooms of older children.* These differences in staffing requirements create differentials in the cost of caring for children of different ages, and the cost differentials should be reflected in fee differentials. Surprisingly, fees differentiated on the basis of age of child are not very common. As noted, only 14 percent of centers receiving parent fees differentiate rates on the basis of age of child. Only six percent of centers receiving welfare reimbursement are paid differential rates based on age of child. It is apparently not common for centers to differentiate fees on the basis of differences in the cost of caring for children of different ages.*

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* The FIDCR set minimum staff/child ratios for two-year-olds at 1:4 and minimum ratios for four- and five-year-olds at 1:7. These regulations require centers to utilize 75% more staff hours in caring for two-year-olds than in caring for four-year-olds (1/4 ÷ 1/7 = 1.75).

For a number of reasons, a comparison of average fees per full-time child and average expenditures per FTE child does not provide an uncontestable measure of the degree to which fees are set to cover operating expenses. Many centers have fairly complex fee schedules – parent fees and welfare fees, differentiated rates for full-time children, special hourly rates for part-time children. With such an array of fees, it is not possible to calculate from telephone survey data an average rate per FTE child. It is therefore not possible to convert fees and expenditures to a comparable basis (dollars per FTE child per year).

Despite these limitations, a comparison of average fees and expenditures does provide a rough indication of the correlation of fees and expenditures across different types of centers. For profit centers, average fees and expenditures per child are nearly equal. For profit non-FFP centers, average fees range from about $1,100 to $1,300 per year ($21 to $25 per week, converted to a 52-week year); average expenditures per FTE child are $1,230 per year. In profit FFP centers average expenditures ($1,430) are slightly higher than the maximum fees paid by parents and welfare agencies ($27 per week, or about $1,400 per year). Since profit centers receive very little non-fee income (cash contributions are low, and such centers are ineligible for the Child Care Food Program), a close correlation between fees and expenditures is to be expected.

Among non-profit centers, maximum fees scaled to 52 weeks per year are noticeably lower than average annual expenditures per FTE child. For non-profit non-FFP centers the difference is about $200 per year ($1,430 for expenditures vs. $1,250 for maximum parent fees). For non-profit FFP centers the difference is greater than $500 per child per year ($2,190 for expenditures vs. $1,350 for maximum parent fees or $1,660 for maximum welfare rates). In non-profit centers, especially non-profit FFP centers, a substantial fraction of annual revenue comes from non-fee income – contribution from charitable organizations, parent fund-raising efforts, the Child Care Food Program, etc. It appears that non-profit centers, much more commonly than profit centers, set fees below the level necessary to cover annual operating expenses. By covering a significant portion of operating expenses out of non-fee income, non-profit centers are able to maintain fees that are competitive with the rates charged by profit centers.[*]

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* To some extent, the low frequency of fees differentiated on the basis of age of child may be due to the fact that many centers enroll only three-, four- and five-year-olds. Because of the homogeneity of the ages of the children they enroll, such centers have limited incentive to differentiate fees by age of child.

Caregiver Salaries

As is common in other occupations, day care centers do not pay all staff members the same salary or wage rate. Salaries are based on job function, education, experience and a variety of other factors. The average salary range for full-time[**] staff who work in classrooms is $95 to $138 per week (Table 24). Extrapolated to a 52-week year, the average salary range is $4,940 to $7,180 per year. While the great majority of these staff earn more than the federal minimum wage, day care classroom staff are paid far less than the $13,400 average annual salary of public school teachers.[§] Even those staff whose salaries are at the upper end of the average salary range ($7,180 per year) are earning barely enough to support a family.[§§] As mea-

Table 24: Weekly Wages Paid to Classroom Staff*

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers
Average of Highest Weekly Salaries	118	139	124	160	138
Average of Lowest Weekly Salaries	80	94	91	102	95

Reference: Tables 132, 133

* Data reflect wages paid to full-time (35 hours or more per week) classroom staff.

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[*] It should be noted that the comparison of fees and expenditures is more tenuous for non-profit FFP centers than for other types of centers. Non-profit FFP centers include a significant number of Head Start centers and county-operated centers – programs which do not receive revenue on a fee-for-service basis. These centers are not included in the sample from which average fees have been calculated but are included in the sample from which average expenditure per child has been estimated.

[**] Most full-time staff work a 40-hour week, but staff who work as few as 35 hours per week are classified here as full-time.

[§] Federal minimum wage at the time of the survey was $2.30 per hour ($92 for a 40-hour week). Data on public school salaries are from National Center for Educational Statistics, U.S. Department of Health, Education, and Welfare, *Statistics of Public Elementary and Secondary Day Schools*, U.S. Government Printing Office, 1977, p. 44. Data from the 70 day care centers in the on-site survey indicate that hourly wage rates for 93 percent of classroom staff are equal to or above the federal minimum wage.

[§§] Thirty percent of caregivers are the sole income earners for their families, and 69 percent provide more than half of their family's income.

sured by the U.S. Department of Labor, the average annual budget of a "low-income" urban family of four in the U.S. is over $10,000.*

Variations in salary scales across centers are similar to variations in number of paid staff and total personnel expenditures. Non-profit FFP centers have the highest average salaries ($102-160 per week) and a high average number of paid staff per center (c.f. Table 13). It is therefore not surprising that centers of this type have the highest average personnel expenditures (c.f. Table 18). Profit non-FFP centers pay the lowest average salaries ($89-118 per week), have the lowest average number of paid staff per center and consequently have the lowest average annual personnel budget.

TOTAL RESOURCE COST

Many of the resources – labor, space and materials – utilized by day care centers are not paid for out of operating budgets. Five percent of center staff are paid by outside agencies (e.g., CETA or a community agency which sponsors the day care center); another 14 percent of staff are volunteers. These staff are part of the donated resources that are utilized by many day care centers, especially by non-profit centers (Table 25). Two out of every five non-profit centers use donated space; only two percent of profit centers have donated space. Some equipment – toys, furniture, kitchen appliances, etc. – is donated each year to 34-42 percent of non-profit centers and 12-14 percent of profit centers. The value of these donated resources must be added to actual center expenditures to estimate the resource cost of center-based day care.**

It is difficult to impute a fair market value to the donated resources that day care centers receive. A center may have free use of a very large church basement as space for its day care program but have only 20 children enrolled. To impute a market rental rate to all of the floor space available would likely overestimate the rent the center would actually pay if it had to find and pay full cost for alternative space. Similarly, it is difficult to estimate the extra personnel costs centers would be willing to pay (and pass along to parents in the form of higher fees) were it unable to obtain the services of volunteers and staff paid by outside agencies.

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* Louise McGraw, "Family Budgets," *Monthly Labor Review*, Vol. 100, July 1977, p. 35. The budget estimate is based on the cost-of-living indices in Autumn 1976.

** In virtually all instances, resources provided under CCFP are in the form of cash reimbursement. They are therefore very likely to be fully accounted for in the income and expenditure estimates provided above.

Table 25: Use of Donated Space, Equipment and Labor

	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers
Percent of Centers With Donated Resources:					
Space	2	40	2	41	25
Equipment	12	34	14	42	28
Volunteer Staff	15	36	22	57	36
Staff Paid by Outside Agencies	1	13	2	39	17
Amount or Value of Donated Resources:					
Annual Value of Donated Equipment ($/Center)	50	300	70	680	330
Average Total Volunteer Hours Per Year	180	520	300	900	530
Percent of Centers Participating in Dept. of Agriculture's Child Care Food Program*	NE	33	NE	75	57*

Reference: Table 126

NE: Not eligible; only non-profit centers are eligible.

* Percent of eligible (non-profit) centers.

Despite these difficulties, it is possible to provide a rough estimate of the approximate value of donated resources. On the basis of relatively conservative assumptions, the value of donated resources utilized by day care centers each year is about $80 million.* Of this total, the value of volunteer and second-party-paid labor accounts for about $55 million, the value of donated space accounts for about $10 million, and about $6 million is represented by donated equipment. The $80 million total is heavily concentrated in non-profit centers – about 40 percent in non-profit non-FFP centers, 55 percent in non-profit FFP centers. Added to the almost $1.3 billion in annual operating expenditures across all centers, the value of donated resources brings the total resource cost of center-based day care to just under $1.4 billion per year and increases cost per FTE child per year from $1630, on an expenditure basis, to $1730, on a total resource cost basis. The difference between expenditure per child and resource cost per child will of course be the largest in non-profit centers.*

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* CCFP resources are not included. As noted in the previous footnote, these resources are likely to be adequately accounted for in reported income and expenditure estimates provided above.

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* The following assumptions were used to impute a value to donated resources: (1) the difference in annual occupancy cost per FTE child between centers with and without donated space ($182 vs. $88 per year) represents the market value of donated space; (2) volunteer hours worked per year were valued at prevailing federal minimum wage ($2.30 per hour at the time of the survey); (3) staff-persons paid by outside agencies work an average of 25 hours per week, and their services are valued at federal minimum wage per hour; (4) directors' estimates of the annual market value of donated equipment ($330 per center per year) is an accurate assessment of what the center would pay were such donated materials not available. These assumptions, especially valuation of donated labor at federal minimum wage, are likely to be conservative. The $246 million estimate is therefore likely to be a reasonable lower-bound estimate of the value of donated resources.

PART TWO: DAY CARE REGULATIONS AND DEGREE OF COMPLIANCE

Day care centers in the United States are regulated by local, state and federal agencies. Local fire, health and housing codes affect the location and physical characteristics of facilities and mandate operating procedures designed to promote safety, sanitation and availability of emergency medical care. State and/or local licensing standards control program characteristics, enrollment policies, staff qualifications, group size and staff/child ratios. The Federal Interagency Day Care Requirements (FIDCR) regulate centers which receive funds under various titles of the Social Security Act (largely, Title XX) and under the Child Care Food Program of the U.S. Department of Agriculture.

Several recent studies have addressed various issues pertaining to day care regulation. The content and language of state licensing standards have been summarized,* and the effect of federal regulations on administrative cost and the day care market has been analyzed by means of case studies in ten states.** To this point, however, discussion of day care regulation has been hampered by the absence of an adequate data base – with which major issues of compliance and market impact could be examined empirically. With data from the Supply Study, such analyses are now possible.

This section deals with three specific regulatory issues: (1) the degree to which day care centers are currently in compliance with existing regulations; (2) the alternative definitions, interpretations and computational procedures that can be used in monitoring compliance with the most controversial aspect of existing regulations, staff/child ratio requirements; and (3) the sensitivity of measures of ratio compliance to alternative monitoring interpretations and computational rules.

CURRENT DEGREE OF REGULATORY COMPLIANCE

The task of determining the degree to which centers comply with existing regulations is complicated. The diversity of requirements imposed on centers by state licensing codes is great – both in scope and detail. Some provisions appear to be intended more as recommendations than as requirements. Many components of existing regulations, including the FIDCR, are vague; no uniform and measurable criteria for determining compliance can be derived from the language that is used. To narrow the scope of the task to manageable proportions, a subset of existing regulatory provisions has been selected for discussion – the staffing requirements in both the FIDCR and state licensing codes and other important provisions of the FIDCR.

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* TEAM Associates, *Comparative Licensing Study*, 1977; Pacific Consultants, *Child Day Care Management Study, Volumes 1 and 2*, August, 1976.

** APWA/REAP, *Title XX FIDCR Impact Study*, 1977.

Compliance with Federal and State Staffing Requirements

Staff/child ratios in day care centers are regulated by both state licensing codes and the FIDCR. With the exception of Mississippi, each state has licensing standards that limit the ratio of children to adults in day care center classrooms. State regulations apply to virtually all day care centers in the state. The FIDCR apply to only those centers receiving particular federal funds. In early 1976, shortly after the enactment of Title XX, a moratorium was placed on the enforcement of FIDCR staff/child ratio regulations for children between six weeks and six years of age in day care centers receiving reimbursement under Title XX. Enforcement was not suspended, however, for centers receiving reimbursement under other federal programs (e.g., Title IV and CCFP), nor were Title XX centers allowed to increase their ratios of children to adults above the level they maintained in 1975.[*]

Staff/child ratio requirements are generally different for children of different ages. With the exceptions of Alaska, Montana and New Jersey,[**] states permit a larger number of children to be supervised by a single carrier the older the children being supervised; the same is true for the FIDCR. Table 26 compares the maximum child/staff[§] ratios permitted by FIDCR for children of different ages with the average ratio permitted by state regulations.

The average state ratio requirements presented in Table 26 require explanation. The language of the staffing requirements in state licensing codes is diverse. Some states (e.g., North Carolina) impose different staffing requirements on centers of different sizes. Some states make staffing requirements contingent upon the number of children of a certain age enrolled in the center.* Some states impose no staffing requirements at all for children above certain ages (e.g., Connecticut has no staffing requirement for children older than three years). This diversity complicates the task of calculating comparable ratio requirements across states.

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[*] The FIDCR were established in 1968 but never systematically enforced by federal agencies. In 1976 the Title XX amendments to the Social Security Act modified the 1968 standards somewhat, incorporated them into federal law and instituted severe penalties for non-compliance. The controversy generated by the impending enforcement of the Title XX ratio requirements caused Congress to institute a moratorium on *federal* enforcement of ratio standards.

[**] Alaska and Montana both limit the number of children per adult to 10, although Alaska recommends that ratios no higher than 5:1 be maintained for children under three years of age. New Jersey's staffing requirement states simply that there be two staff-persons for each classroom group.

[§] Ratio requirements are generally expressed in either of two ways – as a minimum ratio of adults to children (staff/child ratio) or as a maximum ratio of children to adults (child/staff ratio). For ease of interpretation, statistical tables in this report express ratio requirements in terms of the maximum allowable ratio of children to adults.

Table 26: Maximum Child/Staff Ratios Permitted by FIDCR and State Regulations by Age of Child

	Maximum Number of Children per Caregiver	
Age of Child	**FIDCR Ratio***	**Average Effective State Ratio**
Under 2 Years	4.0	6.6
Two	4.0	9.4
Three	5.0	11.4
Four	7.0	13.7
Five	7.0	16.5
Six	15.0	18.6
Seven to Nine	15.0	19.1
Ten or Older	20.0	19.6

Reference: Table 27

* The staffing requirements shown for the Federal Interagency Day Care Requirements (FIDCR) are those incorporated into Title XX Amendments to the Social Security Act. Title XX modified the staffing requirements in the 1968 version of the FIDCR by adding an explicit ratio requirement for children under three years of age (1:1 for children under six weeks and 1:4 for children six weeks to three years of age). In addition, the 1968 ratio requirements for children six years and older (1:10) were relaxed (1:15 for children six to ten years old and 1:20 for children ten years old or older). So few children under six weeks of age are cared for in centers that the 1:1 requirement for children in that age group has been ignored in this study.

Table 27 presents "effective" maximum child/staff ratios for each state for each of the eight age categories used in this study. In most cases, the numbers in the table have been taken directly from the language of the pertinent regulation. For example, the FIDCR requirement of no more than five children per adult for three-year-olds translates to a maximum child/staff ratio of 5.0. In other cases elaborate computations were required to translate the language of regulations into the equivalent of an effective maximum child/staff ratio.

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* Massachusetts, for example, limits group size for children between 15 and 32 months of age to nine and requires one adult for the first four children in the group and a second adult for the next five children.

Table 27: Staff Staffing Requirements — Effective Maximum Child/Staff Ratios by Age of Child

(Children per Caregiver)

State	Under Two Years	Two Years	Three Years	Four Years	Five Years	Six Years	Seven to Nine	Ten or Older	Average for All Ages*
Alabama	5.0	7.5[a]	10.0	20.0	20.0	22.0	23.3[b]	25.0	14.3
Alaska	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Arizona	9.0[a]	10.0	15.0	20.0	25.0	25.0	25.0	25.0	17.2
Arkansas	6.0	8.0[b]	12.0	15.0	18.0	18.0	18.0	18.0	13.5
California	4.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	11.9
Colorado	5.0	7.0	10.0	12.0	15.0	15.0	15.0	15.0	11.3
Connecticut	4.0	4.0	NR	NR	NR	NR	NR	NR	NER
Delaware	6.5[a]	11.5[a]	15.0	20.0	20.0	25.0	25.0	25.0	15.0
D.C.	4.0[c]	6.0[a]	8.0	10.0	15.0	15.0	15.0	15.0	9.3
Florida	7.0[a]	12.0	15.0	20.0	25.0	25.0	25.0	25.0	15.9
Georgia	7.8[b]	10.0	15.0	18.0	20.0	20.0	25.0	25.0	15.1
Hawaii	0.0[d]	10.0	15.0	20.0	25.0	25.0	25.0	25.0	17.8
Idaho	6.5[a]	9.0	10.0	10.0	10.0	NR	NR	NR	11.2
Illinois	6.0	8.0	10.0	10.0	25.0	25.0	25.0	25.0	11.7
Indiana	4.5[a,d]	5.0	10.0	12.0	15.0	20.0	20.0	20.0	11.3
Iowa	4.0	6.0	8.0	12.0	15.0	15.0	15.0	20.0	10.6
Kansas	4.0[a]	6.0[a]	10.0	10.3[b]	10.4[b]	16.0	16.0	16.0	10.0
Kentucky	6.0	8.0	10.0	12.0	15.0	15.0	17.2[a]	20.0	10.9
Louisiana	7.0[a]	12.0	14.0	16.0	20.0	25.0	25.0	25.0	13.7
Maine	0.0[d]	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Maryland	6.0[c,d]	6.0	10.0	10.0	13.0	NR	NR	NR	11.2
Massachusetts	2.9[b]	3.2[b]	4.7[b]	13.5[a]	15.0	15.0	NR	NR	8.4
Michigan	4.0	7.0[a]	10.0	12.0	20.0	20.0	20.0	20.0	12.2
Minnesota	5.5[a]	8.5[a]	10.0	10.0	10.0	15.0	15.0	15.0	10.2
Mississippi	NR	NR	NR	NR	NR	NR	NR	NR	NR
Missouri	NR	5.0	10.0	10.0	10.0	15.0	15.0	15.0	10.1
Montana	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Nebraska	4.0	5.0	7.0	7.0	12.0	12.0	12.0	12.0	8.0
Nevada	5.0[a]	8.0	10.2[b]	10.3[b]	10.1[b]	10.0[b]	10.0[b]	10.0[b]	9.5
New Hampshire	4.0	4.0	10.0	15.0	18.0	20.0	20.0	20.0	13.4
New Jersey	6.6[e]	7.7[e]	7.6[e]	7.6[e]	7.6[e]	6.9[e]	7.6[e]	7.5[e]	7.6
New Mexico	10.0	10.0	15.0	15.6[b]	15.5[b]	15.0	15.0	15.0	13.8
New York	4.5[a]	5.0	5.0	7.0	7.0	10.0	10.0	10.0	6.3
North Carolina	8.7[f]	11.8[f]	13.1[f]	15.4[f]	16.3[f]	17.6[f]	18.1[f]	21.3[f]	13.3
North Dakota	4.0	4.0	6.0	6.0	10.0	15.0	15.0	20.0	6.7
Ohio	8.3[a]	10.0	15.0	15.0	20.0	20.0	20.0	20.0	15.4
Oklahoma	5.0[a]	8.0	12.0	15.0	15.0	20.0	20.0	20.0	10.8
Oregon	4.0	7.0[a]	10.0	10.0	10.0	15.0	15.0	15.0	10.3
Pennsylvania	8.0[c,d]	8.0[c,d]	8.0	10.0	10.0	13.0	13.0	13.0	9.6
Rhode Island	5.0[c,d]	5.0[c,d]	5.0[a]	7.5[a]	12.5[a]	NR	NR	NR	7.8
South Carolina	6.0	8.0	10.0	14.0	15.0	15.0	15.0	15.0	11.2
South Dakota	5.0	5.0	8.0	8.0	8.0	10.0	10.0	10.0	7.2
Tennessee	5.5[a]	8.0	10.0	15.0	25.0	30.0	NR	NR	14.2
Texas	7.0[a]	11.0	15.0	18.0	22.0	26.0	26.0	26.0	15.7
Utah	0.0[d]	10.0	15.0	15.0	20.0	20.0	25.0	25.0	15.4
Vermont	4.0	5.0	10.0	10.0	10.0	12.0	12.0	12.0	9.2
Virginia	4.0	10.0	10.0	10.0	10.0	25.0	25.0	25.0	11.1
Washington	6.0[a]	8.5[a]	10.0	10.0	10.0	10.0	10.0	10.0	9.7
West Virginia	4.0	8.0	10.0	12.0	15.0	16.0	16.0	16.0	11.3
Wisconsin	3.5[a]	7.0[a]	10.0	12.0	16.0	16.0	16.0	16.0	11.1
Wyoming	5.0	8.0	10.0	15.0	20.0	25.0	25.0	25.0	13.3
U.S.	6.6	9.4	11.4	13.7	16.5	18.6	19.1	19.6	12.5
FIDCR	4.0	4.0	5.0	7.0	7.0	15.0	15.0	20.0	6.3

NR = No requirement specified by state regulations.

NER = No effective requirement; existing regulations apply to a very limited age-range of children.

* Calculated as the weighted average of requirements for specific age categories (number of children in each age category used as weights).

Footnotes a-f appear on following page.

Table 27 continued

[a] In some states, different ratios are specified within one or more of the age categories used in this study. In Alabama, for example, a maximum ratio of 5:1 is allowed for children 2 to 2.5 years old, while 10:1 is the maximum ratio for children 2.5 to 3 years old. In these instances, data from the Supply Study on-site survey were used to estimate the relative weight which should be given to each within-category ratio. These relative weights were used to estimate an average ratio for the Supply Study age category. Since two-year-olds in day care centers are distributed relatively equally between the below-2.5-years and above-2.5-years categories, the 7.5:1 ratio reported and used for two-year-olds in Alabama is a straight average of the 5:1 and 10.1 ratios.

[b] In some states the number of staff required for children of a particular age is dependent upon the number of children enrolled in that age category. In Nevada, for example, one staff-person is required for the first 20 children enrolled above the age of three, and an additional adult is required for each additional 15 children. In such instances, the ratio of children to required staff was calculated for each affected age group on a center-by-center basis, using survey data on actual enrollment. These center-specific ratios were averaged across centers, and the state-wide average is reported in the table.

[c] When states specified no ratio requirement for children under certain ages (e.g., under two years in the District of Columbia), ratios for children of the next oldest age were used for the young children.

[d] Some states prohibit the enrollment of very young children in day centers or require that special permission be obtained. In such instances a 0.0 ratio of children to staff is reported when no centers in the survey reported enrolling children in the excluded age category. When one or more centers reported enrolling children in these age categories, the ratio specified for the next older age category was used to calculate required staff and is reported in the table.

[e] New Jersey's regulations require two caregivers per classroom group; no age-specific ratio requirements are included. "Effective" ratio requirements for New Jersey were calculated by dividing center enrollment by twice the number of classrooms in the center (the appropriate measure of required staff). This center level ratio was then applied to each age group represented in the center and averaged across centers in the state to estimate an average effective ratio for each age category. If a center enrolled no five-year-olds, its ratio was not used to calculate the state's average ratio for the five-year-old category; the same was done for other age categories. The effective ratios reported in the table for New Jersey vary slightly across age categories. These variations are the result of differences in the sample of centers used to calculate ratios from one group to the next (e.g., only centers with six-year-olds enrolled were included in calculations of the average effective ratio for six-year-olds at the state level).

[f] North Carolina's staff/child ratio requirements are contingent upon the size of the center (enrollment) and specify separate classes for very young children. Separate ratios of children to required staff were calculated for each age group in each center and then averaged across centers to estimate the average effective ratios at the state level.

In those cases in which relatively complex calculations were required to calculate effective ratio requirements, the language of the state regulation had to be examined to determine the most appropriate computational approach. No single approach worked in all instances. Some examples are useful to illustrate the types of computations used:

- *New Jersey* – Two caregivers are required for each classroom in the center, regardless of the ages of children in the room. The number of classrooms in a center was multiplied by 80 (2 staff times 40 hours per week) to determine the number of caregiver-hours required for the entire center. The total number of child-hours of care provided (scheduled-hours multiplied by 0.88 to adjust for absences) was then divided by the total number of caregiver-hours required. The resulting ratio (e.g., 5.0 = 2000 child-hours divided by 400 caregiver-hours) was then used as the maximum allowable ratio for all age-categories of children in the center.
- *Nevada* – One staff-person is required for the first 20 children under three years of age, and an additional adult is required for each additional 15 children under three. The number of children under three in a center was determined from survey data, and a determination was made of the number of caregiver-hours required to supervise those children (e.g., seven children would require 40 caregiver-hours per week). The total number of child hours of care provided to children under three (adjusted for absences) was then divided by the required number of caregiver-hours. The resulting ratio (e.g., 7 children times an average of 35 hours per child times 0.88 adjustment for absences divided by 40 caregiver-hours equals a 5.39 ratio of children to adults) was then used as the child-to-adult ratio required by state licensing standards, on the basis of prevailing circumstances in the center. Although Nevada's regulations permit ratios as high as 20:1 for children under three, the language of the regulation is such that some centers (those with fewer than 20 children under three) must provide more than one caregiver-hour for each 30 child-hours of care provided to infants and toddlers.

In all instances the effective child/staff ratio requirements reported in Table 27 represent the ratio of child-hours of care provided to minimum number of caregiver-hours permitted by the language of the pertinent state regulation. Since the denominator is an effective minimum, the reported child/staff ratio is an effective maximum.

State child/staff ratio requirements, computed in this fashion, are reported in Table 27 by state for each of eight age categories of children. These data are useful for comparisons of the relative stringency of age-specific ratio requirements across states. Also reported in Table 27 by state are effective ratio requirements at the center level (averaged across all ages of children and all centers in the sample). These latter estimates provide a single index of the relative stringency of the diverse set of regulations that currently exist.

Large differentials in ratio requirements exist across state requirements and between state and federal requirements. Among the states, New York stands at one end of the spectrum, with state ratio requirements at least as strict as those of any other state for most age categories of children. In fact, when the age distribution of children enrolled in center care in New York is taken into account, New York's staffing requirements average out to stricter standards than those imposed by the FIDCR.* Mississippi stands at the other end of the state spectrum, with no state staffing requirements at all.

The differential between federal and state staffing requirements is greatest for children between the ages of two and six years. For this age range the "average" state licensing standard permits about twice the ratio of children to adults as is allowed by the FIDCR. For many states the differential between federal and state standards is much larger, including some states with very large day care populations (e.g., Florida and Texas). Outside the two-to-six age category the comparative strictness of the FIDCR requirements is reduced.

Since the age distribution of enrollment varies widely across centers and, to a lesser extent, also varies across states, comparison of federal and state staffing requirements on an age-by-age basis does not provide a single comprehensive measure of the relative stringency of the two sets of regulations. Center-level ratios have been used in Table 28 to compare the effective ratio requirements under both federal and state regulations. On the basis of national averages, state requirements imply a maximum child/staff ratio of 12.5 children per caregiver, compared to the average FIDCR maximum of 6.3 children per caregiver – a difference of about 2 to 1. Under state licensing codes, about 85 percent of U.S. centers are allowed a center-level maximum of more than seven children per caregiver. In contrast, only 15 percent of U.S. centers would be permitted center-level maximums above 7:1 by the FIDCR.

The child/staff ratios that day care centers currently maintain are much closer to federal standards than to state standards. The average center-level ratio of child-hours to caregiver-hours in U.S.

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* As Table 27 indicates, the average maximum child/staff ratio permitted by New York's licensing regulations is 6.3 children per adult, the same as the maximum permitted by FIDCR for the average U.S. day care center. When the FIDCR ratio provisions are applied to the age distribution of day care enrollment in New York, the average maximum ratio allowed by FIDCR in New York is 6.5 children per adult – slightly less stringent than the maximum allowed by New York's licensing code.

Table 28: Child/Staff Ratio Requirements and Actual Child/Staff Ratios

Maximum Number of Children per Caregiver	State Requirement (Percentage of Centers)	FIDCR Requirement (Percentage of Centers)	Actual* (Percentage of Centers)
No Requirement	3.8	NA	NA
15.1 or More	22.3	0.4	2.1
11.1 to 15.0	36.5	0.5	7.2
9.1 to 11.0	21.9	1.9	10.8
7.1 to 9.0	8.7	11.6	18.4
5.1 to 7.0	6.0	75.1	30.0
3.1 to 5.0	0.6	10.4	25.5
3.0 or Fewer	0.1	0.0	6.0
	100.0	100.0	100.0
Mean Ratio	12.5	6.3	6.8**

NA: Not applicable.

Reference: Tables 142-144

* Ratio of FTE child enrollment adjusted for absences (12%) to scheduled FTE caregiver classroom hours.

** From Table 7 above, actual child/staff ratios by type of center are as follows:

Non-FFP Centers	Average Ratio	FFP Centers:	Average Ratio
Profit	7.9	Profit	7.3
Non-Profit	7.3	Non-Profit	5.5

centers is 6.8, just slightly above the FIDCR ceiling of 6.3, but well below the 12.5 average allowed by state regulations. Were centers to change their child/staff ratios to the maximum permitted by state regulations, they could serve almost twice as many FTE children as are presently enrolled without any increases in classroom staff. Conversely, they could serve the same number of children as are presently enrolled but reduce their classroom staff by 50 percent. Such changes would obviously entail an enormous departure from current day care practices.

Table 29 compares the percentage of centers of various types that currently have sufficient staff to satisfy government staff/child ratio requirements.* About 94 percent of the centers in the U.S. have sufficient classroom staff to comply with state requirements. Slightly more than half of all U.S. centers have sufficient staff to comply with FIDCR staffing requirements, but this percentage varies widely across types of centers. Only 38 percent of non-FFP centers have sufficient staff to comply with the FIDCR, compared to 67 percent among all FFP centers and 76 percent among non-profit FFP centers.

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* The definitions and computational procedures used to determine compliance with staffing requirements approximate very closely the monitoring rules currently recommended by the Administration for Public Services, the agency within the U.S. Department of Health, Education, and Welfare with responsibility for interpreting federal day care regulations. Issues of measurement and interpretation are discussed in detail below.

The number of classroom staff which would have to be added nationally to achieve compliance with federal and state staffing requirements is not as large as previously anticipated.* To satisfy state staffing requirements in centers not now in compliance, an

Table 29: Compliance with State and Federal Staffing Requirements

	(Percentage of Centers)				
	Non-FFP Centers		FFP Centers		
	Profit	Non-Profit	Profit	Non-Profit	All Centers
State Ratio Requirements					
Percent Comply	93	92	91	97	94
Current FTE Caregivers	22,100	25,600	9,500	46,800	104,000
Required FTE Caregivers	12,700	12,700	5,600	21,200	52,200
Percent Don't Comply	8	8	9	3	6
Current FTE Caregivers	1,400	1,700	700	1,100	4,900
Required FTE Caregivers	1,800	2,100	900	1,500	6,300
FIDCR Ratio Requirements*					
Percent Comply	32	44	40	76	51
Current FTE Caregivers	7,300	1,220	4,400	38,300	62,300
Required FTE Caregivers	5,900	8,700	3,500	26,800	44,800
Percent Don't Comply	68	56	60	24	49
Current FTE Caregivers	16,200	15,000	5,800	9,600	46,600
Required FTE Caregivers	25,000	21,700	8,600	12,400	67,700

Reference: Tables 149, 150

* Congress has imposed a moratorium on federal enforcement of FIDCR ratio standards; when the moratorium is lifted only FFP centers would be required to comply.

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* Congress earmarked an additional $200 million in federal funds under Title XX to ease implementation of staffing requirements. At an annual average wage of $6,900 (including fringe benefits), these funds would have enabled an additional 29,000 full-time classroom staff to be hired in day care facilities.

additional 1,350* FTE caregivers are needed. Among FFP centers not currently in compliance with the FIDCR, an additional 5,500* FTE classroom staff are needed. These additional staff would represent one percent and five percent increases, respectively, in the number of FTE caregivers currently employed in all U.S. centers.

Degree of Compliance with the Other Provisions of the FIDCR

Data from the Supply Study have also been used to measure the degree to which centers currently comply with provisions of the FIDCR other than ratio requirements. The other federal requirements discussed in this report are the following:

- *Maximum Group Size* – The FIDCR place ceilings on the number of children placed in a single group or classroom. For three-year-olds the maximum group size is 15 children, for four- and five-year-olds the maximum is 20, and for older children no more than 25 children are allowed per group. No group size maximums are specified in the FIDCR for children under three years of age. In the computations presented here two important interpretations have been made of the language of the FIDCR group size provision. First, the group size ceiling of 15 children for three-year-olds has also been applied for children under three, on the assumption that no more lenient a standard would be appropriate for younger children. Second, in groups containing children of different ages, the group size limit specified for the youngest child in each group has been applied to the entire group.
- *Nutritional Requirements* – The FIDCR require that centers provide meals and snacks for children. This provision has been interpreted as requiring that centers serve (a) breakfast and/or a morning snack, plus (b) lunch, plus (c) an afternoon snack and/or dinner. To meet the definition of compliance used here, a center would have to provide a minimum of three meals or snacks per day.
- *Health Requirement* – The FIDCR contain several provisions related to health services offered to children. Survey data are adequate to determine compliance with only one aspect of the FIDCR health requirements, that all children have a physical examination at the time they enroll in the center. The compli-

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* These numbers differ slightly from those that can be calculated from Table 29 because the counts of caregivers presented in the table have been rounded to the nearest 100 FTE staff.

ance measure used is not that centers actually provide examinations at center expense but that centers require a physical examination as a prerequisite for enrollment.

- *Social Services* – The FIDCR require that centers provide or coordinate social services to families, under the supervision of a trained and experienced staff member. Supply Study data could not be used to determine whether a trained or experienced social service coordinator was available at each center, but centers were asked whether they provided "counseling on family problems," "assistance in obtaining food stamps or financial aid," or "assistance in obtaining community services such as housing or medical care." An answer of yes for any of these services was interpreted as evidence of compliance with FIDCR social service provisions – even though the answer did not indicate how often and to how many families such services were provided.
- *Counseling on a Child's Development* – The FIDCR require that centers provide counseling and guidance to parents on the appropriateness of day care for a child and provide a periodic assessment of the child's development and adjustment. Those centers that indicated that they "provided as a service to parents counseling on their child's development" were judged to satisfy this FIDCR provision – again, despite absence of any indication as to how often or to how many families such counseling was provided.
- *Parent Participation* – The FIDCR require that all centers with enrollments of 40 or more children have a parent advisory board, with 50 percent parent representation, to provide parents with an active voice in center decision-making. Parents must also have an opportunity to observe and participate in the care of their child while at the center. Two alternative definitions of compliance with the parent participation requirement are used here. First and more stringent, centers were judged to comply if they allowed parents to participate in staff selection and/or review budgets and programs and/or participate in fund-raising activities. Alternatively, centers were judged to comply if they allowed parents any of the roles just mentioned and/or if they allowed parents to serve as volunteers at the center.

Supply Study data could not be used to determine the degree of compliance with provisions of the FIDCR other than those listed above.

Table 30 presents estimates of the percentage of centers which currently comply with the provisions of the FIDCR listed above. Separate estimates of the degree of compliance are presented for each of the four principal types of centers discussed in this report.

Table 30: Compliance with Provisions of the FIDCR Other Than Child/Staff Ratio Requirements

(Percentage of Centers)

FIDCR Provision	Non-FFP Centers		FFP Centers		All Centers
	Profit	Non-Profit	Profit	Non-Profit	
Comply with FIDCR Group Size Limits	69	64	63	56	63
Provide Adequate Meals and Snacks*	82	83	89	92	87
Require Health Exam When Child Enrolls	91	94	86	91	91
Provides Counseling to Parents on Child's Development	79	84	83	94	86
Provides Family Counseling and/or Assistance in Obtaining Welfare Aid and/or Help in Obtaining Community Services	51	63	70	89	69
Allows Parents an Active Voice in Center Governance					
– Enrollment Below 40**	19	50	27	75	43
– Enrollment 40 or More	17	55	4	78	51
Allows Parents an Active Voice in Center Governance and/or Uses Parents as Volunteers at Center					
– Enrollment Below 40**	28	55	33	78	49
– Enrollment 40 or More	26	60	34	81	57

Reference: Table 152

* Three or more meals and/or snacks served per day.

** The FIDCR require parent advisory councils only in centers with 40 or more children enrolled.

For many of the categories – provision of meals and snacks, requirement of health examinations, provision of social services and counseling on child's development – the degree of compliance is high across all types of centers.

Two important conclusions emerge which will need to be addressed in future monitoring efforts. First, a higher percentage of FFP centers (42%) than non-FFP centers (33%) maintain group sizes in excess of the ceilings imposed by the FIDCR. Non-profit FFP centers, the group with the best performance record in other regulated areas, have the poorest record for compliance with FIDCR group size provisions. Second, profit FFP centers adhere to many of the FIDCR provisions (e.g., child-development counseling to parents, parent participation) with only slightly higher frequency than profit non-FFP centers and sometimes with a lower frequency than non-profit non-FFP centers. It would appear that current monitoring efforts are not successful in significantly influencing the behavior of profit FFP centers in some of the areas regulated by the FIDCR.

ALTERNATIVE GUIDELINES FOR MONITORING COMPLIANCE WITH STAFFING REQUIREMENTS

If the staffing requirements in government day care regulations are to be enforced in an effective and equitable fashion, the language of the regulations must be translated into a precise, detailed and realistic set of monitoring guidelines. The task of developing such a set of guidelines is difficult, but the definitions, interpretations and computational procedures which are chosen will have a significant impact on the effective stringency of a given set of staffing regulations. Which monitoring procedures are chosen will also affect the volume of information which must be collected from centers and, as a result, the administrative cost of the monitoring process.

Problems of defining and measuring compliance with staff/child ratio requirements are discussed below in terms of FIDCR ratios. The diversity of staffing requirements in state licensing regulations – in both language and substance – is so great that state regulations are not useful for illustration of some basic and important points about interpretation and measurement. The monitoring issues which are discussed here are those which can be analyzed with data collected from the Supply Study. Issues such as the appropriate frequency of monitoring visits and the use of observation versus record-based monitoring procedures are outside the scope of this report.[*]

Although the language of the staffing provisions in the FIDCR appear to be quite specific, in fact a number of questions concerning definition and measurement are left unanswered. Among these unanswered questions are the following:

Must compliance be measured on a group-by-group basis or at the center level?

If compliance is measured on a group-by-group basis, monitoring agents must determine the number of children in each group in the center, identify the age composition of the children in the group, determine the number of staff required to satisfy FIDCR staffing requirements for each group and count the number of staff assigned. If the number of staff assigned falls short of the number of staff required for even a single group in a center, the center is not in compliance with ratio standards. If compliance is measured at the center level, the monitoring agent must determine the total number of children in the center (or the number of child-hours of care provided) for each age category for which separate FIDCR ratio standards are specified. Ratio requirements would then be applied to these center-level counts of children (or child-hours) to determine the number of caregivers (or caregiver-hours) required for the entire center. This number would be compared to the total staff available at the center level to determine compliance.

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[*] See Travers, J., Coelen, C., Ruopp, R., et al, *National Day Care Study: Second Annual Report*, (Cambridge, MA.: Abt Associates Inc., April 1977), pp. 21-30 for discussion of some of these other issues.

Measuring compliance at the center level rather than the group level has two important consequences. First, it avoids the problem of having to deal with frequent changes in group structure over the course of the day, as activities change and part-time children arrive and leave. Second, it permits excess staff in one classroom to cancel out a shortage of staff in another classroom. The monitoring agent in an enforcement role ignores the appropriateness of specific matchings between children and staff in some groups and determines regulatory compliance on the basis of whether or not the center as a whole has sufficient staff resources to satisfy the intent of ratio requirements. The monitoring agent would then be able to suggest ways in which specific matchings between children and adults could be improved and, in an advisory (technical assistance) capacity, could promote the recommended changes. The choice of measuring compliance at the center level rather than at the group level decreases the effective stringency of ratio requirements. It also decreases the complexity of the enforcement process.

Which ratios apply in age-mixed classrooms?

If compliance is measured at the center level, the sensible monitoring rule is to apply different ratios to each of the age groups in the center – 4:1 ratios to two-year-olds, 5:1 ratios to three-year-olds, etc. If monitoring occurs at the group level, however, a decison must be made as to which ratio requirements are to be used in groups containing children of different ages.

As an illustration of the choices available, consider a group of 20 children, comprised of 4 two-year-olds, 10 three-year-olds, and 6 four-year olds. There appear to be three reasonable choices as to which ratio requirement to apply: (A) use the ratio stipulated for the largest age cohort in a group for all the children in the group; (B) use different ratios for each age group; (C) use the ratio stipulated for the youngest age child in a group for the entire group. The implications of the three rules in this illustration are as follows:

(A) 20 children x 1/5 ratio = 4 staff-persons;

(B) 4 x (1/4) + 10 x (1/5) + 6 x (1/7) = 3.86 staff persons;

(C) 20 children x 1/4 ratio = 5 staff-persons.

273

The issue of how to deal with fractional staff requirements (e.g., 3.86 staff) will be discussed shortly.

Which of the three alternatives is chosen will have an impact on center behavior. First, the use of rule C rather than A or B increases the relative stringency of staffing requirements in any center which age-mixes groups across FIDCR ratio categories. Thus rule C creates an incentive for centers to not mix two-year-olds with three-year-olds, three-year-olds with four-year-olds, etc. It also imposes a hardship on small centers, for which low enrollments limit the centers' ability to control the age composition of groups. Rule A, in contrast, encourages age mixing. By scattering a limited number of two-year-olds in groups of predominantly three-, four- and five-year-olds, the center avoids entirely the relatively stringent staffing requirements that the FIDCR imposes for young children. Only rule B has a neutral effect on center's decisions about age composition of groups.

Should children and staff be counted on a head-count or an hours-count basis?

For purposes of computing child-to-staff ratios, monitoring agents can count children and staff in terms of number of individuals, without regard to the number of hours each individual spends at the center per week. Part-time children would be counted equally with full-time children, the same for part-time and full-time staff. Such an approach is a head-count method. Alternatively, monitoring agents can count children and staff in terms of hours spent at the center per week – an hours-count method. The hours-count method ignores what hours of the day and what days of the week children and staff are present but does adjust for duration of time at the center. The head-count method ignores both when children and staff are present and the duration of the time in the center.*

The only potential advantage of the use of a head-count method is that it significantly reduces the amount of information which has to be collected from centers. Relative to an hours-count approach, it creates a strong incentive for centers to utilize many part-time staff and to refuse part-time enrollment. Heavy reliance on part-time staff has the potential disadvantage of reducing the stability of child-caregiver relationships.

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* A third, much more time-consuming monitoring procedure, is to obtain schedules of attendance for both staff and children for all hours of the week. Such schedules would allow the monitoring agent to identify serious mismatches between child schedules and staff schedules.

Which staff-members should be counted in computation of ratios?

Non-classroom staff, volunteers, even classroom aides can be excluded from computation of ratios. The time that classroom staff spend outside the classroom (e.g., attending meetings, preparing meals or filling out records) can also be excluded from computations. There are a variety of arguments that can be made for or against the exclusion of certain staff or portions of the time of caregivers from ratio computations. Two observations are germane to the themes being developed here. First, difficulties in determining who works in the classroom and for how many hours per week make the task of both center directors and monitoring agents more difficult as more exclusions are made in monitoring guidelines. Second, the greater the number of staff categories and staff functions which are excluded from countable staff hours, the greater the effective stringency of a given set of ratio requirements.

What adjustments, if any, should be made for child absences?

A monitoring agent can ignore absences completely in calculating ratio compliance or can make some adjustment in required staff-hours, in recognition of the fact that some children are likely to be absent on any given day. If some adjustment is to be made, a decision must be made as to how the adjustment factor is to be determined. If the adjustment is to be based on the average previous absence rate experienced by the center, data must be collected on numbers of children absent for each center. It should be clear that a decision to make no adjustment for absences increases the effective stringency of ratio requirements.

How should fractional staff requirements be handled in determining compliance and additional staff requirements?

In the illustration used above to discuss which ratio requirement is applicable at the group level, computation rule B yielded a staff requirement of 3.86 persons for a group of 20 children. When ratio requirements are computed at the center level, fractional staff requirements occur quite frequently. An important question faced by monitoring agents is how to deal with fractional requirements. Would a group-level requirement of 3.86 caregivers be satisfied closely enough by a staff of three full-time and one three-quarter-time staff persons, or would the monitoring agent have to round up to four full-time caregivers? This is essentially an issue of what tolerance, if any, the center is allowed when compliance is determined.

Three observations should be made on the issue of tolerances. First and most obvious, the less tolerance is allowed the greater the effective stringency of ratio requirements. Second, unless some tolerance is allowed, centers may experience relatively severe "notch" effects. Consider a center that enrolls 20 full-time three-year-olds and 20 full-time four-year-olds. If no tolerance is allowed, the cost of enrolling one additional child is a full additional caregiver – an incremental cost of $5,000-$6,000 for one child. Until the center has a waiting list of at least several children, it cannot effectively provide care to more children. Finally, if compliance is measured on a group-by-group basis, a decision to allow no tolerances may cause the center to add several more caregivers to satisfy fractional staffing requirements in each group or to significantly rearrange its grouping patterns (including the age composition of groups) to isolate the fractional requirement in one or two groups.

The Administration for Public Services (APS)* of the U.S. Department of Health, Education, and Welfare is responsible for interpreting the FIDCR and defining appropriate monitoring guidelines. Since the federal government has postponed full enforcement of the ratio provisions of the FIDCR, APS has deferred specification of a definitive set of guidelines. However, APS has provided states with substantial suggestions for monitoring procedures and, as a result, has provided interpretations and guidance on many of the monitoring issues raised above.** To the extent possible the measures of compliance presented in this report are based on APS interpretations and suggestions.

SENSITIVITY OF MEASURES OF FIDCR RATIO COMPLIANCE TO ALTERNATIVE MONITORING APPROACHES

Which particular set of monitoring guidelines are adopted by APS will significantly influence the effective stringency of whatever set of staff/child ratio requirements the federal government ultimately chooses to enforce.§ A relatively lenient set of regulations combined with a relatively stringent set of monitoring guidelines may have exactly the same impact on actual day care center grouping and staffing patterns as a relatively stringent set of regulations combined with a relatively lenient set of monitoring procedures. Any significant relaxation of federal staffing requirements and the simultaneous adoption of lenient monitoring guidelines could virtually eliminate the large differential that currently exists between federal and state staff/child ratio regulations. In effect, the choice of monitoring guidelines may have almost as important an impact on the quality and cost of day care as the choice of regulations themselves.

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* APS was formerly known as the Public Services Administration.

** Public Services Administration, U.S. Department of Health, Education, and Welfare, "Monitoring Out-of Home Child Care Services: A Guide" (1976) and "Guide for Monitoring Day Care Centers" (1976); Administration for Public Services, U.S. Department of Health, Education, and Welfare, "Information Memorandum, IM-77-19 (APS)," (August 4, 1977).

§ As already noted, there is currently a federal moratorium on enforcement of the staffing requirements incorporated in Title XX legislation. In the interim, the Department of Health, Education, and Welfare is conducting an intensive study of the appropriateness of existing federal regulations. Monitoring guidelines are also being evaluated.

The objective of the discussion that follows is to demonstrate the sensitivity of measures of ratio compliance to the choice of measurement procedures. Of the variety of choices that must be made in selecting an explicit and detailed set of monitoring procedures, some decisions will have little effect on the percentage of centers found to be out of compliance with staffing requirements and on the number of additional staff that would be necessary to bring non-complying centers into accord with regulations. In these instances, choices should be based on feasibility – the amount of information that must be collected from centers, the ease of obtaining the information and the degree to which alternative choices cause centers to change their natural patterns of matching children and staff. Some of the choices that must be made, however, will have a very significant effect on the relative stringency of a given set of regulations. In these instances choices should be based on quality and cost considerations – the same criteria that should be used in selecting regulations themselves.*

Table 31 presents several measures of the effective stringency of FIDCR staff requirements under alternative monitoring scenarios. These measures demonstrate the sensitivity of degree-of-compliance and additional-staff-requirements to the various choices which must be made in developing an operational set of monitoring guidelines. All of the issues discussed in the previous section of this chapter are addressed by the estimates presented in the table. The computational procedures used to generate the estimates are relatively complex and are not discussed here.

As was noted earlier, the primary measure of ratio compliance presented in this report is based on guidelines and interpretations currently recommended by APS. On the basis of APS guidelines, approximately two-thirds of the FFP centers in the U.S. have sufficient classroom staff to comply with FIDCR staffing requirements. Among those centers not currently in compliance, an additional 5,500 FTE caregivers would be required to achieve full compliance.

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* The cost and quality implications of alternative day care regulations and monitoring guidelines were discussed in Chapter Eight of this volume.

Table 31: Comparison of Measures of FIDCR Ratio Compliance Under Alternative Monitoring Guidelines

Method Used to Calculate Compliance with Ratio Requirement	Average Ratio of FTE Children To Required FTE Caregivers (FFP Centers)	Percentage of FFP Centers in Compliance	Characteristics of Non-Complying FFP Centers		
			Number of Additional FTE Caregivers Required	Number of FTE Caregivers Currently Available	Number of FTE Children Currently Enrolled
1. **Supply Study:** 12% Adjustment for Absences; Compliance measured at center-level; Volunteers counted. Children and caregivers counted on hours-basis (rather than head-count basis). Additional staff required rounded-off to nearest quarter-time staff person (staff-hour deficit of less than 5 hours per week allowed as tolerance).	6.41	68	5,500	15,400	143,800
2. No adjustment for absences; otherwise, the same rules applied as listed for row 1.	5.64	55	9,200	22,400	186,800
3. Monitoring on group-by-group basis, using age of largest age-cohort in group as determinant of which ratio to apply to entire group, otherwise, the same rules applied as listed in row 1.	5.90	59	7,800	20,200	173,400
4. Monitoring on group-by-group basis, using specific ratios for each age-cohort in group to determine required staff for group; otherwise, the same rules applied as listed in row 1.	5.82	58	8,200	20,800	176,800
5. Monitoring on group-by-group basis, using age of youngest child in group as determinant of which ratio to apply to entire group; otherwise, the same rules applied as listed in row 1.	5.53	52	9,800	23,300	192,500
6. Volunteers not counted as satisfying ratio requirement; otherwise, the same rules applied as listed in row 1.	6.41[a]	63[a]	5,800[a]	18,100[a]	151,700[a]
7. Children and staff counted without regard to hours per week (head-count basis); otherwise, the same rules applied as listed in row 1.	6.52[b]	79	3,600[b]	10,600[b]	97,900[b]
8. Additional Staff required rounded up to the next half-time person (no tolerance for very slight deficits between actual and required staff); otherwise, the same rules applied as listed in row 1.	6.41	64	6,300	16,700	150,500
9. **Most Stringent Monitoring Guidelines:** No adjustment for absences. Monitoring on group-by-group basis with ratio requirement for youngest aged child in group applied to entire group; **Volunteers counted**[c]. Children and staff counted on an hours-basis. Additional staff required rounded up to next half-time person (no tolerance).	4.78	37	16,600	32,300	247,000

[a] These estimates are not *strictly* comparable to the other estimates presented in the table. They were derived from data collected during the fall and winter rounds of telephone interviews. Because they do not account for variations during summer months (the other estimates are annual averages), they do not represent "annual average" measures of ratio, compliance and center characteristics.

[b] Staff, children and the ratio of children to required staff are measured in terms of number of individuals (head-count) rather than in terms of FTE's.

[c] Exclusion of volunteers would have increased the stringency of the compliance measure applied. Data on volunteer hours in the classroom were available for only two rounds of the survey, so annual-average measures could not have been calculated were volunteers to be excluded. Since exclusion of volunteers has only a slight effect on compliance measures (compare rows 1 and 6), the divergence from "most stringent" practice is relatively minor.

The average center-level ratio of FTE children to FTE required staff is 6.4. These are baseline figures against which measures of compliance under alternative monitoring procedures can be compared.

As alternative monitoring interpretations and computational procedures are compared, one at a time, against the set of procedures currently recommended by APS, several conclusions emerge:

- Conversion from an hours-count basis for measuring compliance to a head-count basis would significantly increase the percentage of centers currently satisfying the FIDCR staffing requirements;
- A decision to provide centers with no tolerance in cases of fractional staffing requirements or a decision to exclude volunteers as countable toward satisfaction of staffing requirements would have little impact on the measured degree of compliance nationally; such decisions would significantly reduce the flexibility of monitoring offices to adapt regulations to special circumstances, however, and would impose significant hardships on some centers (e.g., co-op centers staffed entirely by volunteers);
- A decision to make no adjustment for child absences or to monitor on a group-by-group basis would significantly reduce the degree of measured compliance. If monitoring is carried out on a group-by-group basis, which rule is used to determine the applicable ratio at the group level is quite important.

A serious compliance problem would emerge if all of the monitoring guidelines were changed simultaneously and the most stringent choices were adopted in each instance. Under the most stringent set of monitoring rules, the percentage of centers in compliance with the FIDCR staffing provisions would fall from 68 under the current APS guidelines to 37 percent. The number of additional caregivers required in non-complying centers would increase from 5,500 to 16,600. Such a major change in monitoring procedures would require strong evidence that the changes were necessary to protect the welfare and to promote the development of children enrolled in center-based day care.

Table 32 provides two estimates for each state of the percentage of centers currently satisfying FIDCR staffing requirements. One estimate is based on the current APS recommended guidelines, the other on the most stringent set of monitoring rules. Again, there is dramatic evidence that measured compliance is very sensitive to which set of monitoring guidelines is employed. Under current APS guidelines 26 or more states have 60 percent or more of their FFP centers in compliance with FIDCR. Under the most stringent guidelines only 5 states have 60 percent or more of their FFP centers in compliance. These data indicate the validity of a point raised

Table 32: Compliance with FIDCR Child/Staff Ratio Requirements Under Alternative Monitoring Guidelines by State

State	Percentage of FFP Centers in Compliance, Supply Study Monitoring Guidelines*	Percentage of FFP Centers in Compliance, Most Stringent Monitoring Guidelines*
Alabama	92	64
Alaska	NA	NA
Arizona	34	22
Arkansas	57	28
California	71	42
Colorado	48	16
Connecticut	71	25
Delaware	93	73
D.C.	39	7
Florida	31	7
Georgia	68	27
Hawaii	50	11
Idaho	42	6
Illinois	60	32
Indiana	73	49
Iowa	73	25
Kansas	88	54
Kentucky	68	29
Louisiana	58	47
Maine	100	38
Maryland	100	93
Massachusetts	73	49
Michigan	38	28
Minnesota	87	45
Mississippi	NA	NA
Missouri	43	19
Montana	53	36
Nebraska	71	56
Nevada	NA	NA
New Hampshire	87	56
New Jersey	80	41
New Mexico	54	19
New York	86	52
North Carolina	91	65
North Dakota	NA	NA
Ohio	57	36
Oklahoma	57	17
Oregon	89	57
Pennsylvania	85	56
Rhode Island	52	41
South Carolina	78	43
South Dakota	87	21
Tennessee	76	45
Texas	51	23
Utah	23	11
Vermont	92	64
Virginia	33	9
Washington	62	41
West Virginia	66	24
Wisconsin	78	43
Wyoming	51	7
U.S.	68	37

NA: Sample size too small (less than 10); no estimate provided.

Reference: Table 157

* For the following states estimates are based on sample size of only 10 to 19 centers: Arizona, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Hawaii, Idaho, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Nebraska, New Hampshire, New Mexico, Oregon, Rhode Island, South Dakota, Utah, Virginia, Washington, Wisconsin and Wyoming. See preceding table for definition of monitoring and computational rules used.

earlier: *The stringency of the monitoring guidelines used to interpret and enforce a set of day care regulations can have as large an impact on the characteristics of day care services as the stringency of the regulations themselves.*

APPENDIX B: THE INFANT/TODDLER DAY CARE STUDY

This appendix summarizes the results of the Infant/Toddler Day Care Study, a substudy of the National Day Care Study (NDCS) (See Volume IV-D[1]). The Infant/Toddler Day Care Study supplements the information gathered by the NDCS, provides the policymaker with a broad range of descriptive data, and partially meets the need for more data about the types, availability and quality of center care for children under three.

OBJECTIVES OF THE INFANT/TODDLER DAY CARE STUDY

The lack of information and major research dealing with the impact of center-based day care on infants and toddlers has presented a major challenge to federal policymakers who wish to develop and implement regulations that both protect children from harm and positively affect their growth and development. When the Infant/Toddler Day Care Study was commissioned, there was a clear need for information about the specific characteristics of infant day care centers and for studies that compare and contrast measurable characteristics within a sample of centers. The present study provides important information not only for the use of officials responsible for day care regulations at the state and federal levels, but for infant day care providers and parents as well.

The major objectives of the Infant/Toddler Day Care Study were:

- To expand information about the availability and characteristics of center care for children under three, and
- To describe the activities of caregivers and children in infant and toddler groups through classroom observations and relate measures of those activities to potentially regulatable center characteristics.

OVERVIEW OF FINDINGS

Characteristics of Infant/Toddler Care

Center-based day care for infants and toddlers is relatively common in the South but rare in the northern and western regions of the nation. Almost 8 percent of the total day care center enrollment in the southeast and southwest portion of the nation is under two years old compared with about 2 percent in northern and western states. For children between the ages of two and three (24-35 months), the difference in enrollment between the South and other areas of the country is still apparent, though less dramatic (10% in the South versus 8% in the rest of the U.S.). Overall, about 61 percent of the children under three enrolled in day care centers are found in the southern regions of the nation; about 47 percent of children under three in federally subsidized center care are in the South. Day care for children under three accounts for 11 percent of all day care supported with public funding.

The age composition of typical day care center groups indicates that two-year-old children (24 to 35 months) are in transition from infant/toddler care to preschool care. About 40 percent of the centers visited during the study had separate groups for children under 30 months of age and those over 30 months. Frequently, day care groups for children over 30 months included three-year-old children.

In day care centers, infants and toddlers are found in small groups* more frequently than preschool age children. Group sizes observed in the Infant/Toddler Study averaged 7.1 children in infant groups and 11.3 children in toddler groups. Nationally, more than 70 percent of children under two are assigned to groups of ten or fewer children compared with 51 percent of the two-year-olds and less than 33 percent of three- and four-year-old children.

Although observed ratios of staff to children were generally high in infant and toddler groups, considerable variation in ratio exists. The average observed ratio for children under 18 months of age was 1 adult for every 3.9 children. The observed ratios ranged from 1 adult for 1.3 infants to 1 adult for 10.3 infants. For children between 18 and 24 months of age, the average observed ratio was 1 adult for every 5.9 children and observed ratios ranged from 1 adult for 2.0 toddlers up to 1 adult for 14.4 toddlers.

Center staff assigned to work directly with infants and toddlers typically have less formal education but slightly more experience than staff assigned to preschool and school-age groups. In addition, few training programs currently available focus specifically on care for infants and toddlers.

Center directors report that reimbursement from public agencies generally is not higher for infants and toddlers even though states require higher staffing ratios for younger children. Because staff salaries are a major component (about 70 percent) of all center expenditures, the provision of infant care should cost centers more if other factors are held roughly equal. Therefore, it may be that centers that care for infants and toddlers are not being equitably reimbursed and that some centers might not provide care for this age group because it is too expensive.

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* Here, and throughout this appendix, the term "group" refers to the day care center classroom.

Caregiver and Child Behavior

The composition of day care groups (number of children and number of staff per child) is related to the quality of experience for infants and toddlers and to the behavior of caregivers. Caregivers spend less time "managing" children, and infants and toddlers cry less (show less distress), in groups where there are fewer children and higher staffing ratios. In infant groups, high ratios are associated with lower levels of child apathy and potential danger.

Staff qualifications (education, experience, and specialized training) are related to some caregiver behaviors, but less consistenly so than group composition measures. Education of staff is related to the amount of social interaction, cognitive-language stimulation and conversation with other adults in toddler groups, and to lower levels of child apathy and potential danger in infant groups. The study's measure of specialized training rarely achieved statistical significance but consistently related to caregiver behavior in a manner corresponding to caregiver education. Greater staff experience was associated with higher ratings of child apathy in both infant and toddler groups and with less social interaction and cognitive-language stimulation in infant groups.

THE REGULATORY CONTEXT

The movement of women into the labor force and other changes in the American family (increasing numbers of single-parent families, the decline of extended family networks and the increasing need for a second income even in middle-income families) have led to widening debate about the desirability of and need for day care centers serving infants and toddlers.[2] In fact, since 1960, the labor force participation of mothers with children under three increased by 17 percent to 35 percent, the largest increase in participation rate among mothers.[3] Today increasing numbers of day care centers are responding to family needs by offering care for infants and toddlers, but the impact of the distinctive features of a group child care environment on very young children is unknown. These features include exposure to a relatively large group of peers and to multiple caregivers, separation from parents and siblings during the day and an environment quite different from a typical home setting. As infant/toddler center care has grown, both federal and state governments have been increasingly concerned in recent years with regulating this form of center care. Before examining the findings of the Infant/Toddler Day Care Study in detail, it is important to review the current regulatory context.

Current Federal Role

The use of center day care for children under three years old has become a national policy issue during the past decade. When the Federal Interagency Day Care Requirements (FIDCR) were promulgated in 1968, fewer than half of the states licensed centers to care for children under three years of age. The 1968 FIDCR contained neither ratio nor group size requirements for children under three enrolled in day care centers. These requirements neither supported nor restricted the purchase of center care for children under three with federal funds. However, the FIDCR did contain requirements relating to children under three in family day care homes.

In 1975, a modified version of the FIDCR was incorporated into Title XX of the Social Security Act.[*] The Title XX modifications to the FIDCR authorized the Secretary of Health, Education and Welfare to establish staff/child ratios for children under three,[**] but the amended FIDCR do not contain group size requirements for infants and toddlers. However, the staff/child ratio requirements for children six weeks to six years have been suspended, under certain conditions, pending a revision of federal day care regulations. Because federal ratio requirements for infant/toddler day care have never been in force,[§] state licensing standards are the current basis for regulation of center care for very young children.

Current State Infant/Toddler Day Care Regulations

A review of state regulations pertaining to the care of infants and toddlers in day care centers reveals great variability in scope, specificity, stringency and spirit. Consistency does emerge, however, on several issues. Nearly all state standards specify staff/child ratios; only occasionally is a maximum group size established. Frequently, these standards also contain statements about child development and child rearing, about the role of staff and parents in center care for young children, and about the specific ways in which infant and toddler care should be provided in a center. The following brief discussion of state regulations does not address the relationship between specific regulations and availability of care, or between regulations and ease of monitoring operations or likelihood of com-

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[*] P.L. 93-647, Social Services Amendments of 1974. See discussion of federal day care regulations in Chapter One.

[**] HEW established staff/child ratios of 1:1 for children under six weeks and 1:4 for children six weeks to three years.

[§] Although the staffing requirements have been suspended, centers receiving Title XX funds are required to meet applicable state standards (see Chapter One of this volume).

Table B.1 State Staffing Regulations (Maximum Allowable Ratios by Age Group)

	Under 1 year	1 year - 18 months	18 months - 2 years	2 years - 2½ years	2½ years - 3 years
Average	5.10	5.66	6.76	8.02	8.76
Alabama	5	5	5	5	10
Alaska	5	5	5	5	5
Arizona[a]	8	8/10	10	10	10
Arkansas	6	6	6	12	12
California	ns[b]	ns	ns	12	12
Colorado	ns	ns	ns	ns	8
Connecticut	4	4	4	4	4
District of Columbia	4	4	4	4	8
Delaware	5	8	8	8	15
Florida[c]	6	8	8	12	12
Georgia	7	7	10	10	10
Hawaii	ns	ns	ns	10	10
Idaho	6	6	8	8	10
Illinois	6	6	6	8	8
Indiana	4	4	5	5	5
Iowa	4	4	4	6	6
Kansas[d]	3	5	5	5	7
Kentucky	6	6	6	8	8
Louisiana	5	8	8	12	12
Maine	ns	ns	ns	ns	8
Maryland	ns	ns	ns	6	6
Massachusetts[a]	3	3/4	4	4	4/10
Michigan	ns	ns	ns	ns	10
Minnesota[a]	4	4/7	7	7	7/10
Mississippi[e]	ns	ns	ns	ns	ns
Missouri	4	4	4	8	8
Montana	ns	ns	ns	10	10
Nebraska	4	4	4	5	5
Nevada[a]	4/6	6	8	10	10
New Hampshire	ns	ns	ns	ns	ns
New Jersey	ns	ns	ns	ns	ns
New Mexico	10	10	10	15	15
New York	4	4	5	5	5
North Carolina[f]	8	8	8	12	12
North Dakota[a]	1/4	4	4	4	4
Ohio	8	8	10	10	10
Oklahoma[a]	4/6	6	6	8	8
Oregon	4	4	4	4	10
Pennsylvania	ns	ns	ns	ns	ns
Rhode Island	ns	ns	ns	ns	ns
South Carolina	6	6	6	8	8
South Dakota[a]	1/4	4	4	4	4
Tennessee	5	6	6	8	8
Texas	5	6	9	11	11
Utah	ns	ns	ns	10	10
Vermont	4	4	4	5	5
Virginia	4	4	4	10	10
Washington	5	7	7	7	10
West Virginia	4	4	4	8	8
Wisconsin	3	4	4	6	8
Wyoming	5	5	5	8	8

[a] Standards vary within age group where indicated.

[b] ns: not specified under licensing requirements.

[c] Florida: separate, more stringent standards for subsidized centers.

[d] Kansas: infants defined as non-walkers (1/3); toddlers defined as walkers (1/5).

[e] Mississippi: federal ratios for subsidized centers only.

[f] North Carolina: centers with more than 30 children.

pliance. Rather, this discussion is intended to highlight issues in infant and toddler day care regulations and illustrate them with selected state regulations.

All but five states have regulations concerning center care for children under three. These regulations specify higher* staff/child ratios for infants and toddlers (Table B.1), allowing fewer children per adult as child age decreases. This undoubtedly is a recognition that infants and toddlers are less able to respond independently to environmental dangers, require aid for many critical life functions, and are assumed to require considerable adult attention and guidance for normal development.

In many states, staff/child ratios alone are not viewed as sufficient for ensuring quality care for infants and toddlers. In addition to setting ratios, these state standards deal with broader aspects of quality care, although they vary widely in specification of practices, equipment, program content and staff qualifications for infant and toddler care. One state outlines a program of activities and "experiences which are appropriate for young children, and that stimulate good physical, intellectual and emotional growth." Another identifies types of toys and materials that enhance specific physical and cognitive development in young children. Specific requirements based on child development theory are most often those associated with feeding, toilet training, discipline of toddlers and scheduling of the child's daily activities.

There are no clear correlations between the stringency of a state's ratio requirements and the scope, specificity or stringency of other regulatory components. Some states couple relatively high ratio standards with extensive statements and additional requirements dealing with the quality of care (e.g., Alabama, Colorado, Oregon). States with low ratio standards also frequently stipulate additional requirements aimed at ensuring the quality of infant day care environments (i.e., Illinois and Georgia). Thus, staff/child ratio is generally viewed as necessary but not sufficient to guarantee quality day care – other regulatable characteristics of the center environment for infants and toddlers are also recognized as important by individual states.

Generally cautious approaches toward group care for infants and toddlers are found in state regulations. Missouri, for example, introduces its infant regulations with this statement:

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* High staff/child ratio in the NDCS is defined as fewer children per assigned staff (and, hence more staff time available to each child). For example, 1:5 is higher than 1:7. Note also that staff/child ratio standards alone do not specify the actual composition of a day care classroom or reflect classroom interaction patterns. For example, a ratio of 1:4 may not be equivalent to 2:8 or 3:12 in terms of impact on staff or children involved.

> Group day care for children under 2 years of age shall be permitted for those children for whom the community involved offers no reasonable alternative, such as a sufficient number of family day care homes to provide adequate care, or to meet the special needs of particular groups, such as mothers attending school or training, or migrant workers . . . and shall be permitted only under the direction of a nonprofit facility.

In other states, an approach is embedded in explanatory statements about infant and toddler development. For example, the Illinois regulations state:

> Children under two years of age are completely dependent; have greater susceptibility to communicable disease; require more constant mothering care, physical handling, and supervision; and may have greater emotional difficulty separating from the mother. Also, there are innate problems of group care of infants which make it difficult to provide each child with the individual attention he needs.

Finally, there are regulations such as those of Texas which devote three pages to specific infant regulations and interlace policy statements with specific requirements:

- Infants (children under 18 months of age) in the center shall be in an environment which protects them from physical harm and which stimulates their physical, intellectual, emotional and social development.
- Infants no longer being held for feeding shall have a definite place for eating.
- Provisions shall be made to ensure consistency and stability of relationship in meeting the needs of infants.
  a. One staff member shall be specifically designated to carry primary responsibility for the care and supervision of a specific group of infants.
- Toilet training shall be relaxed and pressure-free.

There appears to be consensus that at least some elements of the traditional home environment are critical to the development of infants and toddlers. Many regulations attempt to ensure that day care environments retain such elements as continuous care by the same adult each day, individual attention for each child, play spaces separate from sleeping spaces, flexible feeding or sleeping schedules, and standards which encourage caregivers to allow children to move about freely.

In practice, the ideal of the home-like atmosphere for center-based infant and toddler care is to be achieved with techniques and equipment unlike most actual homes. Few mothers have engaged in training programs in preparation for parenthood, nor do they necessarily adhere to the practices set down in many state regulations. Rarely is a home as well-equipped, as spacious, or as organized as day care centers are expected – and required – to be.

A home-like environment in a center for very young children has been defined in state regulations to mean an atmosphere of individual attention from familiar staff qualified by education or experience to provide a safe and stimulating environment; an atmosphere in which the growth and individuality of the child is not sacrificed to the organizational requirements of the group setting; and an atmosphere which, although not the same as the home, attempts to be complementary to the home.

Other requirements vary in form and content from state to state, but generally states require the center to retain certain aspects of the home environment. Many states favor general statements of concern and a discussion of developmental needs of children rather than specific requirements for infants and toddlers. Such statements are not often found in regulations for older children; they reflect a particular concern for the impact of the day care environment upon very young children.

STUDY COMPONENTS AND DATA BASES

The Infant/Toddler Day Care Study had three data collection components.

- A telephone interview conducted with directors of 2,536 day care centers, which constituted a national probability sample of all centers in the United States.* Data from this source are referred to in this report as "Supply Study" data.
- In-person, largely open-ended interviews with the directors of 54 centers that care for infants in five widely distributed sites (Atlanta, Georgia; Boston, Massachusetts; Jackson, Mississippi; Portland, Oregon; and Toledo, Ohio) and with 145 classroom staff and 190 parents in those same centers.
- Formal observations of the behavior of 74 caregivers in infant and toddler classrooms in 38 centers, selected on the basis of wide variation in the classroom ratio of adults to children, of the 54 centers visited.

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* Results of the National Day Care Supply Study are reported in Volume III of the Final Report of the National Day Care Study.[4] A summary of Supply Study findings is presented as Appendix A to this volume. Of the Supply Study's 3,167 center sample, 631 centers were added to the initial 2,536 national probability sample for the purpose of supplementary data from small states.

Supply Study Data

Supply Study information constituted the Infant/Toddler Day Care Center Study's national data base and was analyzed to provide descriptive information on the supply and distribution of infant and toddler center care in the United States. The nationally representative sample of day care centers consisted of 2,536 centers, of which 18 percent enrolled five or more children who were under two years of age. The characteristics of that group of centers were compared to the remaining centers to determine how centers that provide care for infants, toddlers and older children differ from centers that enroll only older children. The telephone interview consisted of questions designed to elicit details about center enrollment, group structures, staff characteristics, fee and cost data, and provision of services to children and families.

Interview Data

Visits to 54 day care centers in five states were conducted for the Infant/Toddler Study. Each center visited enrolled ten or more children under three years of age and at least five children under two years of age. Site selections were made on the basis of early Supply Study data that indicated the relative frequency of infant enrollment by state and a review of state regulations regarding center care for infants and toddlers. Sites were selected to provide maximum variation in geographical region, in availability of center care for children under two, and in the stringency of staffing requirements for children under two. On the basis of these considerations, Boston, Massachusetts; Toledo, Ohio; Portland, Oregon; Atlanta, Georgia; and Jackson, Mississippi were selected.*

The centers that constituted the study sample, while not a random or strictly representative sample, were a diverse group that was similar in many respects to the national sample. In the national sample, centers that provided care for infants and toddlers tended to be large (67 children enrolled), most were privately funded (67 percent), and about half were organized for profit (53 percent). The centers visited for the Infant Study were also relatively large (74 children), but only 33 percent were privately funded and 41 percent were organized for profit. These differences were due to the study emphasis on policy-relevant centers – those receiving public funds – and the slight oversampling of day care centers in the northern and western regions of the nation, where a greater proportion of infant/toddler care was publicly funded. About 33 percent of the parents in the centers visited earned less than $6,000 in the previous year (versus 29 percent in the national sample) and about 38 percent of the parents were members of minority groups (27 percent nationally).

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* Boston, Toledo, Portland and Jackson were selected because they exhibited generally high or low ratios. In Atlanta, however, 12 centers with high staffing ratios for infant/toddler groups (1:5 or higher) and 12 with low ratios (lower than 1:5) were visited.

During center visits, directors discussed the operational needs and problems of infant/toddler centers, the qualifications and training of staff and the appropriate level and type of regulations necessary for quality care. Infant and toddler caregivers discussed their role in the center operation, how they handle particular situations that arise in the classroom, and their attitudes about child-rearing. Parents were asked why they needed child care services and why they had chosen a center over other alternatives. Also, they discussed their satisfaction with center staff and the care provided. The interviews consisted mainly of open-ended, exploratory questions designed to identify issues of concern and general attitudes toward infant and toddler group care.

Observation Data

Systematic observations were made of center staff behavior under varying group size and staff/child ratio configurations. Few studies have been completed that actually describe the infant/toddler day care environment and the behavior of day care staff.[5] Each study collected data in relatively atypical centers, where staffing ratios were high and uniform throughout the samples.

In the present study, a formal observation system was designed and employed in day care centers in Boston, Toledo and Atlanta. Selection of observation sites was determined by design needs and resource limitations. Limiting sites to three enabled staff to conduct two-day instead of one-day observations. Boston and Toledo represented high- and low-ratio sites, respectively, and served as comparison groups for high and low ratio centers in Atlanta. Seventy-four caregivers of infants and toddlers were observed in centers with staff/child ratios varying from 1:3 to 1:14. These observations provide information about the relationship of staffing arrangements and characteristics of staff (training, education, experience) to the behavior of caregiving adults and children. Although sites and centers were selected on the basis of variation in staff/child ratio, sufficient variability in group size was found across sites and centers to permit correlations between group size and observation data.

The observations were designed to focus on the activity of caregivers and their involvement with children. Two techniques were used – a "snapshot" of group activities and a time-sample observation of caregiver behavior. The snapshots identified child activities,* described the general nature of adult/child interactions, and provided counts of adults and children before and after each observation period. For each time sample of caregiver activity, 50 behavior "frames" were recorded at 30-second intervals. In all, 450 behavior "frames" were coded for each caregiver over two days of observation. The observations were conducted during the morning hours.

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* The study focused on caregiver behavior and classroom process, and only very limited information on child behavior could be gathered. Therefore, observations of child activities in the classroom were limited to a small set of indicators of negative child behavior or harmful situations, e.g., physical conflict; wild, noisy or disruptive behavior; children in distress; apathetic, withdrawn or listless children; and potential danger situations.

Each observation frame identified the degree and type of caregiver involvement with children, the type of teaching activity involved (if any), verbal activity of the caregiver, and the types of child management situations encountered. The presence or absence of child distress in the group was also recorded during the time-sample observation. Finally, a rating of the amount of physical conflict, potential danger, wild or disruptive behavior, child distress and child apathy was recorded in the observation snapshot.

FINDINGS AND REGULATORY ISSUES

The results of the Infant/Toddler Day Care Study are presented in two categories. *Major findings* of the study are based upon statistical analyses of the Supply Study data and direct observations of caregivers. The *supplementary findings* summarize the views of providers and consumers of infant and toddler care on topics of major interest to those groups. Relatively little statistical analysis of interview data is presented.

MAJOR FINDINGS OF THE INFANT/TODDLER DAY CARE STUDY

National Overview of Infant/Toddler Care

The NDCS Supply Study shows that overall a proportionally small number of infants and toddlers are enrolled in centers. Virtually all centers serving infants and toddlers also serve older children. Of all children enrolled in centers nationwide, only about 4.5 percent are under two years of age. An additional 9.1 percent are two years of age (24 to 35 months). (See Table B.2.)

While children under two constitute only 4.5 percent of all children enrolled in center care, a comparison of current enrollment figures with those of a 1970 survey (Westinghouse-Westat, 1971) indicates that the number of children under two in day care centers has increased by approximately 68 percent during the past eight years. During the same period, enrollment of two-year-old children has increased by 32 percent, while total enrollment has increased only 23 percent. Thus, although the actual number of infants and toddlers in day care centers remains small, their number is increasing more rapidly than other age groups.

Table B.2: Total Center Enrollment by Age of Child and Type of Center

Age of Child	Private Funding		Public Funding		All Centers
	Profit	Non-Profit	Profit	Non-Profit	Total (Percent)
Under Two Years (Birth to 23 months)	15,400	11,200	4,000	9,300	39,900 (4.5)
Two Years (24 to 35 months)	27,300	22,500	9,900	22,300	82,000 (9.1)
Three Years (36 to 47 months)	51,900	57,600	22,200	72,400	204,100 (22.7)
Four Years (48 to 59 months)	62,300	74,800	25,300	95,200	257,600 (28.7)
Five and Older (60 months and older)	81,600	85,600	30,000	116,900	314,100 (34.9)
All Children	238,500	251,700	91,400	316,100	897,700

Source: NDCS Supply Study.

Center-based day care for infants and toddlers is relatively common in the South but rare in the northern and western regions of the nation.

Almost 8 percent of the total day care center enrollment in the southeast and southwest portion of the nation is under two years old, while this age group accounts for only about 2 percent of enrollment in northern and western states. Overall, about 80 percent of the children under two enrolled in day care centers nationally are found in the southern regions of the nation. As Figure B.1 shows, each of the fourteen southern states with the exception of Tennessee has a high proportion (over 5 percent) of infants and toddlers in the overall day care center population. In contrast, only three of the remaining 36 states (Delaware, North and South Dakota) has as high a proportion of infants and toddlers in day care centers. In fact, the most populous states in the nation (New York, Illinois, and California), have fewer children under two enrolled in day care centers than less populous states such as Georgia, Florida, and Oklahoma. Texas has the largest infant-toddler center enrollment (about 17 percent of the total day care center enrollment of infants and toddlers) in the nation.

As indicated in Table B.2, about 67 percent (26,600 out of 39,900) of the children under two and about 61 percent (49,800 out of 82,000) of the two-year-old children in day care centers are enrolled in privately funded centers (predominantly supported by parent fees). This trend is seen primarily in the southern states where over 75 percent of children under three attend privately funded centers compared with 45 percent in the North and West.

Characteristics of Infant/Toddler Centers

The composition of center classrooms may be specified by any two of the following three parameters: number of staff, number of children, and staff/child ratio. Typically, minimum staff/child ratios and maximum group sizes are set by regulation. However, the Title XX FIDCR and the majority of state regulations specify only one parameter (staff/child ratio) for children under three. The Title XX FIDCR specify a single ratio of 1:4 for children from six weeks to three years.

Although observed ratios of staff to children were generally high in infant and toddler groups, considerable variation in ratio exists. During center visits the average observed ratio for children under eighteen months of age (infants) was 1 adult for every 3.9 children. (See Table B.3) The observed classroom ratios ranged across centers from 1 adult for 1.3 infants to 1 adult for 10.3 infants. For children between 18 and 24 months of age (toddlers), the average observed ratio was 1 adult for 5.9 children and observed classroom ratios ranged from 1 adult for 2.0 toddlers up to 1 adult for 14.4 toddlers (Table B.3). In general, publicly subsidized centers maintained ratios that were somewhat higher than privately funded centers.

In day care centers, infants and toddlers are found in small groups more frequently than preschool age children. During center visits infant groups were observed to be smaller (7.1 children) than toddler groups (11.3 children, see Table B.3). Nationally, more than 70 percent of children under two are assigned to groups of ten or fewer children compared with 51 percent for two-year-olds and less than 33 percent of three- and four-year-old children. Center grouping practices and interviews indicated that the upper age limit for toddler groups is often flexible, based upon developmental capabilities of children rather than chronological age, and that placement into preschool groups frequently begins at 30 months of age rather than three years.[6]

Center staff assigned to work directly with infants and toddlers typically have less formal education but slightly more experience than staff assigned to preschool and school age groups. In addition, few training programs currently available focus specifically on care for infants and toddlers.

Both the Supply Study data and the Center Visit Sample allow comparisons of classroom staff within centers that enroll children under three, and data from the two sources was consistent. As indicated in Table B.4, staff who work directly with infants and toddlers have fewer years of education but slightly more experience than staff who care for older children. They also work more hours than their counterparts.

Table B.3: Group Composition of Observed Infant and Toddler Classrooms

	Infant Groups (6 wks to 17 mos)			Toddler Groups (18 to 24 mos)		
	Mean Value	Minimum	Maximum	Mean Value	Minimum	Maximum
Staff/Child Ratio	1:3.9	1:1.3	1:10.3	1:5.9	1:2.0	1:14.4
Number of Children	7.1	3.3	12.6	11.3	4.0	21.5

Source: Infant/Toddler Study, Center Visit Sample of 34 infant and 59 toddler classrooms in 54 centers.

Table B.4: Comparison of Staff Characteristics Within Centers Serving Infants, Toddlers and Older Children

	Staff for Infant/Toddler Groups	Staff for Older Groups
Years of Education	12.3	13.0
Years of Experience	4.5	4.1
Hours Worked	33.0	29.9

Source: NDCS Supply Study Data.

Overall, the observed staff in centers visited for the Infant/Toddler Study attended school somewhat longer than the national average for infant/toddler staff and had slightly less day care experience than the national average. Less than half of either infant or toddler staff in the study centers had age-specific training.

Center directors report that reimbursement from public agencies is not generally higher for infants and toddlers even though states require higher staffing ratios for younger children. In contrast to parent fees, public funding sources generally do not vary reimbursement rates by age of children. For all centers where infants and toddlers are enrolled and some public funds are provided, only 12.8 percent of the directors report that state welfare agencies vary reimbursement by age of children; only 2.7 percent of those directors report that other government agencies adjust reimbursement by age of children. However, states require a higher staff/child ratio for children under two than for older children. Because staff salaries represent a major portion (about 70 percent) of all center expenditures, the provision of infant care costs more if other factors are held roughly equal.

When directors from centers that served infants were asked their opinions about how the costs of care varied for different age children within the center, only four percent of those interviewed felt that costs associated with care for infants were less than for older children. The remainder of the responses were split among those who felt that infant care cost more (47 percent), those who indicated that costs remained about the same as care for older children (41 percent), and those with no opinion (8 percent).

The great majority (70 percent) of directors who believed that infant care costs were higher cited the higher staff/child ratio standards as a major cost factor. These directors also pointed out that special equipment such as cribs and dressing tables contributes to increased costs (61 percent) and that necessary supplies such as diapers and infant formula are significant cost factors as well (57 percent).

Many directors reported that the age of the child partially determines the fees charged to parents (Table B.5). Between 30 and 40 percent of directors of centers that serve infants and toddlers and preschoolers and older children charge higher fees for younger children. Other important determinants of fees are family size, family income, and number of children enrolled from a particular family. The importance of the various factors is roughly the same in centers that are partially subsidized by government and in centers funded entirely by parent fees.

Caregiver and Child Behavior

Observation of infant and toddler groups indicated that the behavior of caregivers and children was related to group composition (staff/child ratio, group size and number of caregivers) and to staff quali-

Table B.5: Determinants of Parent Fees in Centers Serving Infants, Toddlers and Older Children

	Centers Receiving both Public Funds and Parent Fees	Centers Funded Entirely by Private Funds
Age of Child	34.4%	38.9%
Family Income	18.9	11.8
Number of Children Enrolled from a Particular Family	16.3	11.1
Family Size	43.9	44.8

Source: NDCS Supply Study data.

fications (education, experience, training). Although not conclusive, relationships are slightly stronger for ratio and group size than for qualifications and tend to be similar in both infant and toddler groups.

Observations of the day care groups were conducted by two-person bi-racial teams. Each group was observed on two days for about five hours each day. On each observation day, one period of observations was conducted by both observers simultaneously. Inter-observer agreement for each coding category exceeded 70 percent.

Caregiver Behavior Dimensions. Table B.6 summarizes the data for a number of caregiver measures from the time-sample observation and the snapshot ratings. The broad categories listed below and in Table B.6 are general terms for combinations of several aspects of behavior coded:

- MANAGEMENT ACTIVITY refers to attempts by the caregiver to control a child's behavior – to get a child to do or to stop doing something. Although relatively rare, management activity was more often observed in toddler groups than infant groups.
- SOCIAL INTERACTION refers to caregivers actively engaged in interacting with a child or group of children. (This behavior, usually but not always involving verbal interaction, could include caregivers encouraging a child to crawl or walk, instructing a child, playing a game.) This activity occurred at the same rate in both infant and toddler groups. The average number of children involved in interaction at any time was quite small overall and was smaller in infant groups (1.5 children) than in toddler groups (2.4 children).
- COGNITIVE/LANGUAGE STIMULATION refers to caregivers engaging children in cognitive or language stimulation, in the context of either formal or informal teaching situations. This activity occurred far more frequently in toddler classrooms than in infant classrooms.
- ADMINISTRATIVE TASKS refers to caregivers engaging in such tasks as setting tables at mealtime, cleaning diapers, and storing play materials.
- OBSERVES CHILDREN refers to caregivers closely monitoring the activities of a child or group of children without interacting with them.
- TOUCHES CHILDREN refers to the frequency of physical contact between caregivers and any child in the group, and was more common in infant groups.

- TALKS WITH CHILDREN and TALKS WITH ADULTS indicate the occurrence of caregiver conversation with children or adults. As shown, caregivers converse with children, even infants, more frequently than with adults.

Child Behavior Dimensions. Certain child behavior codes were also recorded.

- DISTRESS was coded to indicate the presence of crying in the group. The measure does not indicate which child or how many children were in distress at any time and is therefore useful primarily as a global index of group affect. As expected, more crying was observed in infant groups.
- APATHETIC CHILDREN and POTENTIAL DANGER are measures derived from a global rating of observation periods. The observer scored these measures on a scale of one (no incidents) to four (several or continuous situations). The purpose of the rating scales was to capture rare but important events that may not have been recorded in the time-sample observation.

Table B.6: Selected Set of Observed and Rated Behavior of Caregivers and Children in Infant and Toddler Classrooms*

	Infant Groups		Toddler Groups	
	Mean** Percentage	Standard Deviation	Mean** Percentage	Standard Deviation
Caregiver Behavior				
Management Activity	4.0	3.1	7.2	6.0
Social Interaction	52.0	12.8	52.9	15.6
Cognitive-Language Stimulation*	8.5	6.1	21.5	15.2
Administrative Tasks	18.4	7.6	18.0	10.2
Observes Children	13.7	7.3	14.9	9.0
Touches Children	40.8	16.2	30.2	13.2
Talks with Children	46.8	22.1	50.5	23.4
Talks with Adults	13.6	9.1	8.8	7.9
Child Behavior				
Distress	18.8	12.0	9.6	8.8
Apathetic Children	1.2***	0.5	1.4***	0.5
Potential Danger	1.5***	0.6	1.5***	0.5

Source: Infant/Toddler Day Care Study, observations to 24 infant and 50 toddler groups in 38 day care centers.

* Constructed from codes indicating both formal and informal instruction.

** This figure represents the average, across all caregivers observed, of the frequency with which behavior was observed.

*** Mean value from rating scale (range: 1-4).

Analyses of Effects Findings

Group Composition. Table B.7 illustrates correlations of group descriptors and observed behavior.* As shown, some strong relationships emerge.** The data suggest that the group composition (ratio and group size) of infant and toddler classrooms is associated with the quality of the day care experience for staff and children. The relationships for ratio and group size vary in strength across specific behaviors but in general are in the same direction. Overt child distress was greater in low-ratio infant and toddler groups. Low ratio is also related to increased staff time spent in management or control situations with children. In addition, more infants were observed to be apathetic and exposed to more potential danger in low-ratio situations.

Because low-ratio groups generally contain larger numbers of children in our sample, group size results are similar in form. Caregivers in large groups engaged in more management activity in both infant and toddler groups. In large infant groups, caregivers engaged in less social interaction and less cognitive/language stimulation than in small infant groups. Larger infant groups were also associated with greater distress and more apathetic children.

Staff qualifications (years of formal education, experience, and specialized training) are related to some caregiver behaviors, but less consistently than classroom composition measures.

Education. Staff education is related to the amount of social interaction, cognitive-language stimulation and conversation with other adults in toddler groups, and lower ratings of child apathy and potential danger in infant groups.

Specialized Training. A measure of specialized training rarely achieved statistical significance but consistently related to caregiver behavior in the same positive manner corresponding to caregiver education. However, as indicated by a majority of center directors and many caregivers, so little infant/toddler training is available that true effects of training may not have been discovered. Further research is needed to investigate this issue.

Experience. Staff experience was associated with higher ratings of child apathy and more potential danger situations in both infant and

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* Partial correlations and regression equations are presented in Volume IV-D. The results of those analyses are summarized here.

** Interpretation of results is complicated by the degree of association among group descriptors. In observed infant and toddler groups, staff/child ratio was negatively related to the number of children in a group, and years of education were negatively related to years of experience. Although such confounding is not unexpected in exploratory research, results should be interpreted with this fact in mind.

Table B.7 Correlations of Observed and Rated Behavior to Infant and Toddler Group Descriptor [a]

	Infant Groups (n = 24)					Toddler Groups (n = 47)				
	Staff/ Child Ratio	Number of Children	Staff Education	Staff Experience With Children Under Two	Specialized Training	Staff/ Child Ratio[a]	Number of Children	Staff Education	Staff Experience With Children Under Two	Specialized Training
Caregiver Behavior										
Management Activity	−.33	.40				−.28	.24			
Social Interaction		−.34		−.57				.26		
Cognitive/Language Stimulation		−.36		−.48				.29		
Administrative Tasks		−.36				.24	−.28			−.34
Observes Children				−.58		−.30				
Touches Children						.29				
Talks with Children										
Talks with Adults	.40					.47		.24	.29	
Child Behavior										
Distress	−.56	.37				−.27				
Apathetic Children [b]	−.77	.58	−.44	.66					.33	
Potential Danger [b]	−.48		−.40	.55			.31			

[a] Regression analysis results are generally similar in form and magnitude to the correlations reported here.

[b] Rating scale data.

Note: All values shown are significant at the 10 percent level.

toddler groups and with less social interaction and cognitive-language stimulation in infant groups. The strong positive relationship between caregiver experience and age increases the difficulty of interpreting the results for the experience measures. However, an examination of the relationships of caregiver behavior and experience when age of caregiver was controlled statistically indicates that the behavior-experience relationship remains significant regardless of caregiver age. These results suggest that extensive caregiver experience in infant and toddler groups is associated with less caregiver activity with children.

SUPPLEMENTARY FINDINGS OF THE INFANT/TODDLER DAY CARE STUDY

The supplementary findings are based on interviews with caregivers and parents. The interviews were open-ended, consisting of exploratory questions designed to identify issues of concern and general attitudes toward infant and toddler group care. The views of caregivers and parents on issues of concern to policymakers have been summarized and are presented below.

Parent Involvement. Although neither center staff nor parents expressed a desire to have parents more involved in center administration, the data show that directors and caregivers perceive a need for more direct contact between parents and caregivers of very young children. Although parents reported general satisfaction with their level of communication with staff, many directors and staff wanted parents to show more interest in and to be better informed about their child's daily experience.

In addition, directors and staff reported areas of potential disagreement between caregivers and parents about certain aspects of infant and toddler behavior (feeding, toileting, sleeping) that might be resolved by regular communication. However, effective mechanisms for such communication between parents and caregivers apparently have been developed only in isolated instances.

Developmental Care. The primary reason parents give for using child care is the need or desire to work. Less than 25 percent of the parents interviewed said they would prefer to be paid to stay home with their children and virtually none indicated they would prefer a babysitter or family day home care. One important reason cited by parents for choosing *center* care, as opposed to in-home care or family day care, is that they perceive that centers provide a developmentally oriented program. Other reasons were also cited, e.g., adequate and dependable supervision, convenience of location and lower cost.

Parents' interest in an educational program for young children was shared by directors. Most directors, particularly in the South, felt that an educational program for infants and toddlers is desirable. Such a program, it was felt, should focus on an appropriate level of stimulation for children; on individual, adult-child, or small group activities supervised by adults; and on provision of age-appropriate equipment and materials rather than a structured curriculum or periods of formal instruction. While directors, in general, support regulations aimed at specifying appropriate experiences for infants and toddlers, several indicated a feeling that specification of a rigid educational requirement is inappropriate for this age group. Many feel that it would be a mistake to formulate regulations that are simple downward extensions of preschool standards.

However, very few centers had well-articulated developmental programs for infants and toddlers. Equipment in infant and toddler classrooms tended to be sparse, compared with equipment for older preschoolers. Interest in developmental programs for young children exists side-by-side with uncertainty about the content of such a program.

POLICY IMPLICATIONS OF STUDY FINDINGS

The NDCS Infant/Toddler Study provides the policymaker with a broad range of descriptive information about center care for children under three. The purpose of this section is to frame some of the policy issues relevant to infant and toddler care, in light of study findings, and to identify issues for further research.

Two of the findings from the NDCS Supply Study have particular policy relevance: (1) the unequal distribution of care for infants and toddlers across regions of the United States, and (2) the discrepancy, reported by center directors between required staffing ratios and public reimbursement rates. In addition, observations of caregivers provide policy-relevant information about the kinds of social environments typically associated with alternative staffing ratios and group sizes. Finally, data on the qualifications of staff assigned to infant and toddler classrooms raise questions about the kind of training desirable for caregivers of very young children.

Reimbursement Practices and Staffing Regulations

Analyses of NDCS Supply Study data indicate that current public reimbursement formulas are not geared to staff/child ratio requirements, which are more stringent for infants and toddlers than for preschool age groups. Although the effects of current reimbursement policies cannot be precisely determined, the data suggest that centers that enroll subsidized infants and toddlers must use one or more compensatory mechanisms in order to meet the higher staffing standards required for these children. It would be useful to relate the true cost of infant care to reimbursement rate formulas as an equitable guide to future resource allocation decisions.

Environmental Descriptors and Social Experience in Infant and Toddler Day Care Groups

The study's data base does not allow clear separation of the impact of staff/child ratio and group size from other center characteristics upon the behavior of caregivers and the experiences of children in infant and toddler groups. Further, it should be noted that the general balance of relationships discovered in infant and toddler groups is different from that found in the more comprehensive NDCS research on preschool groups. In infant and toddler groups, staff/child ratio and group size appeared to be equally important as factors relating to the experiences of children and caregivers. In the NDCS preschool findings, group size is a more powerful factor than ratio. It is possible, even likely, that the pattern of relationships among environmental factors and the experiences of infants and toddlers in group care differ from that of preschool children. However, given the emergence of classroom composition effects, there is support for federal policymakers to regulate both ratio and group size for infants and toddlers.

Center practices indicate that two-year-old children are in transition from toddler to preschool groups and placement is frequently made on the basis of child development rather than child age. It may be useful for regulations to allow some flexibility in placing children over 30 months of age into classrooms with three-year-old children. Finally, training programs which are directly relevant to infant and toddler care were found to be generally unavailable. Training curricula and early childhood education materials generally focus upon the preschool child. Since the pattern of relationships for caregiver training and education with behavior suggests that adequate training *may* serve as a surrogate for education, it may be useful both to develop specifically infant/toddler related training curricula and to conduct further research into the effectiveness of caregiver training methods.

OTHER ISSUES

Although most center staff and parents prefer that the center actively pursue a developmental program for infants and toddlers, they are also concerned that an individual care approach be maintained and that levels of stimulation not be raised beyond home-like levels.

Thus a developmental program for infants and toddlers might need to be defined differently than preschool programs or elementary curricula and focus upon unscheduled individual stimulation rather than planned group activities.

Finally, continuity of caregiver/child relationships is frequently discussed in the psychological literature and loosely required in state regulations. It is widely believed that very young children need a single caregiver throughout the entire period of early development. To achieve such stability in the day care setting would require that caregivers work extended hours each week and remain at their jobs for several years. Although the Infant/Toddler Study was not designed to address the issue of continuity of care, data from the Supply Study indicate that caregivers for infants and toddlers work about three hours more each week than the caregivers of older children. Thus, there is some evidence that center care for children under two is more continuous than for preschool and school-age children.

There may exist a trade-off between continuity of care and staff "burnout" – a detachment process related to the excessive demands of the task. Infant and toddler classrooms potentially require more energy from staff because of the relative lack of organized activities and the need for continuous attention to the children. The data suggest that larger groups and lower ratios further reduce the potential for time off from child care classroom duties, as indicated by less time for administrative tasks and less contact with other caregivers. It seems reasonable to assert that concern for the continuity of care must be balanced with a concern for the quality of life for center staff, particularly in infant and toddler rooms where the quality of care is very likely related to the responsiveness of staff to subtle cues from children.

APPENDIX C: NDCS CONSULTANTS, ACYF STAFF AND CONSULTANTS, AND ABT ASSOCIATES STAFF

Abt Associates Inc. and the Administration for Children, Youth and Families recognized from the study's inception the need to subject the design, analyses and findings of the National Day Care Study to rigorous scrutiny by technical and policy experts. Abt Associates Inc. organized a group of consultants who met periodically throughout the study. This nationally selected group of experts reviewed all major reports, advised the NDCS staff and made important suggestions that improved the design and implementation of the study. A Black Task Force subgroup was organized during Phase II of the study. Its members identified technical and policy issues of particular concern to minorities, especially in reviewing the NDCS outcome measures as to their appropriateness and significance for minority children. In addition, they fostered increased involvement of black scholars and day care specialists in the NDCS research (see the *Commentary* following Chapter Eight above).

NDCS CONSULTANT PANEL

The members of the NDCS consultant panel were all selected on the basis of long-standing interest and expertise in day care and early childhood programs.

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NDCS VALIDATION CONSULTANTS

Selected jointly by ACYF and Abt Associates Inc. during the final phase of the NDCS, these senior professionals in the fields of child development, methodology and economics reviewed and suggested revisions to the final research and policy reports.

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NOTES

CHAPTER ONE: INTRODUCTION

1. The Supply Study, a national telephone survey of day care center characteristics, was a supporting study of the NDCS. See Chapter Two and Appendix A of the present volume, as well as C. Coelen, F. Glantz, and D. Calore, *Day Care Centers in the U.S.: A National Profile 1976-1977*, Volume III of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1978).

2. Assistant Secretary for Planning and Evaluation, Department of Health, Education and Welfare, *The Appropriateness of the Federal Interagency Day Care Requirements: Report of Findings and Recommendations* (Washington, D.C.: U.S. Government Printing Office, 1978).

3. This figure was computed from two sources: Congressional Budget Office, *Childcare and Preschool: Options for Federal Support* (Washington, D.C.: U.S. Government Printing Office, 1978), Table 14, p. 46; and U.S. Department of Labor, Bureau of Labor Statistics, *Marital and Family Characteristics of the Labor Force*, March 1978, USDL 78-638, July 24, 1978.

   The Congressional Budget Office reports 15,671,000 mothers in the labor force in 1978. The Bureau of Labor Statistics reports 57,215,000 families in the United States in March 1978. The number of these families with children under 13 is 24,411,000 (43% of all families). We have assumed that all intact families in which both parents work, or those in which single parents work, need some form of day care for their children. Using this definition, the number of families with children under 13 with a potential need for day care is 12,586,000, almost 52 percent, including families headed by single parents.

4. Congressional Budget Office, op. cit., p. 44.

5. Department of Labor, Bureau of Labor Statistics, *U.S. Working Women: A Databook* (Washington, D.C.: U.S. Government Printing Office, 1977), p. 65.

6. B. L. Johnson and H. Hayghe, "Labor Force Participation of Married Women, March 1976," *Monthly Labor Review*, Vol. 100, June 1977, pp. 32-36.

7. Unco, Inc., *National Childcare Consumer Study: 1975*, prepared for Department of Health, Education and Welfare, Office of Child Development (1975), Vol. III, "American Consumer Attitudes and Opinions on Child Care," pp. 2-5.

8. Figures compiled from Unco, Inc., op. cit., Vol. II, "Current Patterns of Childcare Use in the United States," Tables VI-6 to VI-11, pp. 6-8 to 6-11.

9. Ibid.

10. See Coelen, Glantz and Calore, op. cit.

11. Ibid.

12. Ibid., pp. 32-35.

13. Assistant Secretary for Planning and Evaluation, Department of Health, Education and Welfare, op. cit., p. 8-10. The $6.3 billion estimate of private expenditures for day care was computed from data in the *National Childcare Consumer Study: 1975*.

14. See L. McGraw, "Family Budgets," *Monthly Labor Review*, Vol. 100, July 1977, p. 35. The "low budget" figure is based on the cost-of-living indices in autumn 1976; the family day home care lower national average is from unpublished data, Abt Associates Inc., National Day Care Home Study. The low national average for center day care is from Coelen, Glantz and Calore, op. cit.

15. Congressional Budget Office, op. cit., Table 9, pp. 24-26.

16. Ibid.

17. U.S. Department of Commerce, Bureau of Economic Analyses, *Survey of Current Business*, Vol. 58, No. 4, April 1978, p. 10 (Table 1) and p. 14 (Table 12). Figures presented are averages of seasonally adjusted annual rates for fiscal year 1977.

18. U.S. Department of Health, Education and Welfare, Administration for Public Services, *Social Services USA: July-Sept., 1976* (Washington, D.C.: U.S. Government Printing Office, 1978), p. 10.

19. M. O. Steinfels, *Who's Minding the Children? The History and Politics of Day Care in America* (New York: Simon and Schuster, 1973), pp. 66-67.

20. V. Kerr, "Child Care's Long American History," in *Child Care—Who Cares?*, Pamela Roby, ed. (New York: Basic Books, Inc., 1973), p. 163. There are considerable differences in estimates of the number of children who received day care supported

under the Lanham Act. Kerr cites 600,000 children served. Dorothy E. Bradbury in *Five Decades of Action for Children* (Washington, D.C.: U.S. Department of Health, Education and Welfare, Social Security Administration, 1962, p. 61) stated that 1,600,000 children were being cared for in Lanham Act programs in 1945. Gilbert Steiner, in *The Children's Cause* (Washington, D.C.: Brookings, 1976), p. 17, maintains that "the Lanham Act centers were caring for only 105,000 children, although an inflated 1.6 million enrollment figure continues to be quoted." Steiner (in unpublished correspondence) cites a 1969 HEW source to support the 105,000 figure.

21. Kerr, op. cit., pp. 167-169.

22. Ibid. Respondents in the case studies of the NDCS study sites (Atlanta, Detroit and Seattle) also reported expansion of day care services in their areas during this period. See *National Day Care Study Background Materials*, Volume IV-A of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).

23. Economic Opportunity Amendments of 1967, P.L. 90-222, sec. 107(a). The law directed the Secretary of Health, Education and Welfare and the Director of the Office of Economic Opportunity to establish, insofar as possible, "a common set of [day care] program standards and regulations and mechanisms for coordination at state and local levels."

24. See Assistant Secretary for Planning and Evaluation, op. cit., Chapter 4.

25. Social Services Amendments of 1974, P.L. 93-647, sec. 2, 7. The FIDCR were incorporated in sec. 2002(a)(9)(A) of Title XX.

26. P. L. 94-120 (Oct. 1975), sec. 3. This provision has been extended by subsequent amendments: P. L. 94-401 (Sept. 1976) and P. L. 95-171 (Nov. 1977).

27. A comprehensive review of relevant literature has been prepared for the National Day Care Study. See K. Asher and K. Livingston, "Research Issues in Day Care: A Focused Review of the Literature," in *National Day Care Study Background Materials*, op. cit.

    For a review of relevant research, including a number of smaller-scale studies, see J. Belsky and L. D. Steinberg, "The Effects of Day Care: A Critical Review," *Child Development*, 1978, Vol. 49, pp. 929-949.

Major large-scale studies include the following:

S. Low and P. G. Spindler, *Child Care Arrangements of Working Mothers in the United States*, Children's Bureau, no. 461 (Washington, D.C.: U.S. Government Printing Office, 1968).

Westinghouse Learning Corporation and Westat Research, Inc., *Day Care Survey – 1970 Summary Report and Basic Analysis* (April 1971), p. x.

Unco, Inc., op. cit.

28. Westinghouse Learning Corporation and Westat Research, Inc., op. cit., p. x.

CHAPTER TWO: NDCS OBJECTIVES AND DESIGN

1. C. Coelen, F. Glantz, and D. Calore, *Day Care Centers in the U.S.: A National Profile 1976-1977*, Volume III of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1978).
2. D. Connell et al., *Center Day Care for Infants and Toddlers: An Exploratory Policy Study*, Volume IV-D of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).
3. See Stanford Research Institute, *Phase II Instruments for the National Day Care Cost-Effects Study: Instrument Selection and Field Testing* (Menlo Park, CA: Stanford Research Institute, 1976).
4. See J. Travers, C. Coelen and R. Ruopp, *National Day Care Study Second Annual Report* (Cambridge, MA: Abt Associates Inc., 1977), Chapter Five, for a complete discussion of Phase III design and data collection.
5. R. Millett and A. Mathis, "The National Day Care Study from the Perspective of Black Social Scientists: Reflections on Key Research Issues," in *National Day Care Study Background Materials*, Volume IV-A of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).

CHAPTER THREE: THE NATIONAL DAY CARE STUDY SAMPLE

1. A detailed description of the NDCS site and center selection process appears in Appendix A of R. Ruopp et al., *National Day Care Study First Annual Report* (Cambridge, MA: Abt

Associates Inc., 1976); see also Chapter One of J. Travers, C. Coelen and R. Ruopp *National Day Care Study Second Annual Report* (Cambridge, MA: Abt Associates Inc., 1977).

2. U.S. Bureau of the Census, *Census of Population: 1970;* Volume I, *Characteristics of the Population;* Part I, *U.S. Summary;* Section I (Washington, D.C.: U.S. Government Printing Office, 1973).
3. See S. Weiss and M. G. Trend, "Day Care in Atlanta, Detroit and Seattle: History and Current Practices in the Study Sites," in *National Day Care Study Background Materials,* Volume IV-A of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).
4. See Travers, Coelen and Ruopp, op. cit.
5. See C. Coelen, F. Glantz and D. Calore, *Day Care Centers in the U.S.: A National Profile 1976-1977,* Volume III of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1978).
6. See J. Vermillion, "Site and Sample Selection Generalizability," in *National Day Care Study Measurement and Methods,* Volume IV-B of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).

CHAPTER FOUR: THE POLICY VARIABLES

1. It is possible to draw a sample of classes or centers in which numbers of caregivers is independent of one of the other parameters, but it is not possible to draw a sample in which all three variables are independent, because of the mathematical relationship illustrated by Figure 4.1. For example, it is possible to draw a sample of centers in which group size and number of caregivers vary independently, but this can be accomplished only by accepting serious confounding of one or both of these parameters with staff/child ratio. The NDCS chose the opposite course – keeping ratio and group size relatively *un*confounded, while accepting a fairly high degree of confounding between number of caregivers and both of the other composition variables. This choice was made because ratio and group size are the composition parameters that have most often been regulated.
2. Much larger classrooms and much higher ratios than the ones shown in Figure 4.1 are theoretically possible and would

greatly expand the number of possible configurations. But few such classrooms were actually found in the NDCS. There were some large "open classroom" centers in which 100 children or more may be present in a single large space. However, at least for such centers in the NDCS sample, groups of this size are usually organized into well-defined subgroups which function like classrooms under the supervision of a single caregiver or small team of caregivers.

3. See W. Bache, "A Comparison of Alternative Measures of Classroom Composition," in *National Day Care Study Measurement and Methods*, Volume IV-B of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).

4. Among the 96 target classes which did not merge during the April 1977 observations, for example, absentee-adjusted schedule-based averages for group size, number of caregivers and staff/child ratio were identical to the observation-based averages. This indicates that there was no *systematic* (i.e., overall, directional) bias in the schedules of nonmerging classes after correction for absenteeism. Furthermore, the correlation between scheduled and observed group size was .83, and the correlation between scheduled and observed number of caregivers was .75, indicating a reasonably good correspondence for individual classes as well. The correlation for staff/child ratio was lower (.58), but this is partly because the reliability of any arithmetic ratio is lower than that of its separate components. When scheduled and observed ratio were computed from the total numbers of children and caregivers in all target classes combined (for which there is less measurement error), the correlation between the two was .76.

5. Among the 36 target classes that tended to merge in the morning during the April 1977 observations, for example, observed group size was approximately eight children larger than the absentee-adjusted scheduled group size, and the observed caregiver count was larger than the scheduled count by nearly one person. (Many centers merged classes during lunch or nap, but these kinds of activities were not considered relevant to this investigation.) Observed and scheduled ratio were about the same, however, because caregivers tended to merge along with the children.

6. For example, group sizes at lunch are often large, and ratios are usually low during nap, as staff take this opportunity for a break in their day. During a free play period, a caregiver may

momentarily step out of the room, thus substantially decreasing the staff/child ratio. For a discussion of how group size and staff/child ratio varied with activity periods during Phase II, see J. Travers, C. Coelen and R. Ruopp, *National Day Care Study Second Annual Report* (Cambridge, MA: Abt Associates Inc., 1977).

7. Although daily fluctuations in group composition were substantial, long-term fluctuations over the week and year were not. Activity patterns, with their associated group configurations, tended to be stable from day to day; group size, number of caregivers and staff/child ratio were also fairly stable from day to day, for any given activity period. There was a slight tendency for group size to rise over the day care year (from fall to spring) as additional children were enrolled. Number of caregivers tended to be quite stable over the year, so that ratio fell slightly as children were added to groups. Data on long-term fluctuations appear in Travers, Coelen and Ruopp, op. cit., and Abt Associates Inc., *National Day Care Study Phase II Research Report*, unpublished, 1977.

8. Observation measures are normally subject to two sources of unreliability – observer error or disagreement, and fluctuation over time in the phenomenon being observed. The importance of the latter source is generally underrated. In the case of observation-based measures of classroom composition, fluctuation is a far more important factor than subjectivity of the observer. A few classes present some problems in defining the boundaries of a group (e.g., the open classrooms discussed earlier); however, in most classrooms, the number of children and adults in the room can simply be counted, with virtually no observer inaccuracy involved. However, because group sizes and staff/child ratios vary significantly over the day, a perfectly accurate count of staff and children made at a particular point in time can be unrepresentative of the numbers prevailing over most of the day.

   A detailed discussion of reliability of observation measures can be found in Bache, op. cit., and J. Singer, D. Affholter and R. Goodrich, "Variance Components and the Dependability of Measures Used in the NDCS," in *National Day Care Study Measurement and Methods*, op. cit.

9. See L. J. Cronbach, G. C. Gleser, H. Nanda and N. Rajaratnam, *The Dependability of Behavioral Measures: Theory of Generalizability for Scores and Profiles* (New York: John Wiley and Sons, 1972).

10. The correlation between observed staff/child ratio and absentee-adjusted scheduled ratio for 96 classes which did not merge in April 1977 was only .58. This correlation at the center level was .76 (N = 41). The correlation between observed and scheduled enrollment across all target classes, moreover, was .94, and the correlation for total number of caregivers was .89. This indicates that schedule-based monitoring of center-level ratio would best be done by the following two-step process (as recommended in Chapter 8). First, the monitor would determine the total number of children in the center and their ages, and determine from this information the number of caregiver classroom hours required to satisfy the ratio requirements. Then the actual number of caregiver hours would be calculated from the schedule to determine whether the center is in compliance. In this procedure, the correspondence between observed and scheduled ratio is not the direct issue, but rather the components of staff/child ratio.
11. See J. Layzer, "The National Day Care Study Parent Findings," in *National Day Care Study Effects Analyses,* Volume IV-C of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).

CHAPTER FIVE: IN SEARCH OF QUALITY

1. See the useful compendia in D. K. Walker, *Socioemotional Measures for Preschool and Kindergarten Children* (San Francisco: Josey-Bass, 1973); and O. G. Johnson and J. W. Bommarito, *Tests and Measurements in Child Development: A Handbook* (San Francisco: Josey-Bass, 1971). See also the comprehensive review of child development literature in K. Asher and K. Livingston, "Research Issues in Day Care: A Focused Review of the Literature," in *National Day Care Study Background Materials,* Volume IV-A of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).
2. J. Stallings, M. Wilcox and J. Travers, *Phase II Instruments for the National Day Care Cost-Effects Study: Instruments Selection and Field Testing* (Menlo Park, CA: Stanford Research Institute, 1976). Discussions of selection of NDCS dependent variables and instruments also appear in the following sources: R. Ruopp et al., *National Day Care Study First Annual Report* (Cambridge, MA: Abt Associates Inc., 1976); J. Travers, C. Coelen, and R. Ruopp, *National Day Care Study Second An-*

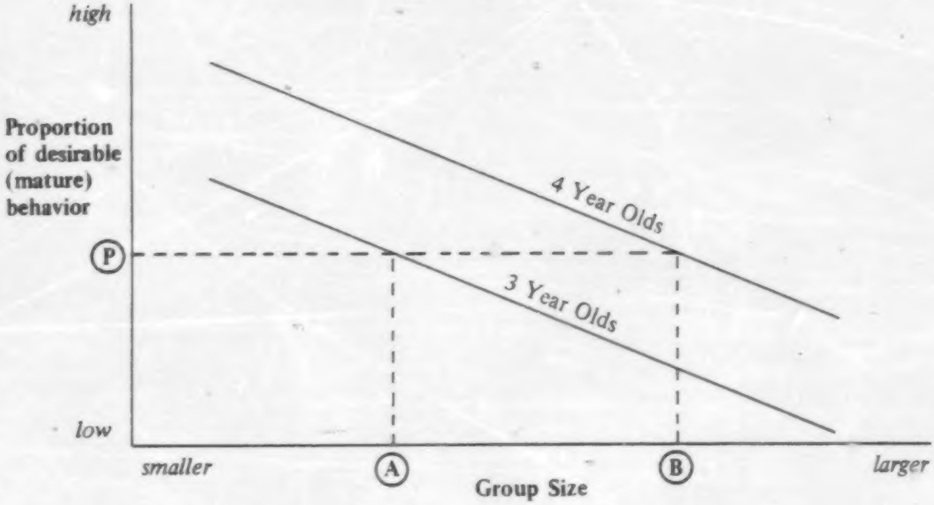
nual Report (Cambridge, MA: Abt Associates Inc., 1977); and J. Travers and R. Ruopp, *Preliminary Findings and Their Implications* (Cambridge, MA: Abt Associates Inc., 1978).

3. See L. J. Cronbach, G. C. Gleser, H. Nanda and N. Rajaratnam, *The Dependability of Behavioral Measurements: Theory of Generalizability for Scores and Profiles* (New York: John Wiley and Sons, 1972).
4. *National Day Care Study Background Materials*, op. cit., and *National Day Care Study Effects Analyses*, Volume IV-C of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).
5. See E. Prescott et al., *Assessment of Child-Rearing Environments* (Pasadena, CA: Pacific Oaks College, 1975).
6. Stallings, Wilcox and Travers, op. cit.
7. Travers, Coelen and Ruopp, op. cit.
8. Abt Associates Inc., *National Day Care Study Phase II Research Report*, unpublished.
9. *Research Results of the National Day Care Study*, Volume II of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).
10. See R. Goodrich and J. Singer, "Cognitive Change in the National Day Care Study," in *National Day Care Study Effects Analyses*, op. cit.
11. See V. Shipman, D. McKee and B. Bridgeman, "Stability and Change in Family Status, Situational and Process Variables and Their Relationship to Children's Cognitive Performance," *Disadvantaged Children and Their Study* (Princeton, NJ: Educational Testing Service, 1976).
12. See also N. Goodrich, "An Analysis of the CDA Checklist Data," in *National Day Care Study Measurement and Methods*, Volume IV-B of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).
13. See B. Maloof and D. Dina, "The Day Care Forces Inventory," in *National Day Care Study Measurement and Methods*, op. cit.
14. Travers, Coelen and Ruopp, op. cit.
15. *National Day Care Study Phase II Research Report*, op. cit.

16. See J. Layzer, "The National Day Care Study Parent Findings," in *National Day Care Study Effects Analyses,* op. cit.

CHAPTER SIX: LINKS BETWEEN POLICY VARIABLES AND MEASURES OF QUALITY

1. *Research Results of the National Day Care Study,* Volume II of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).
2. *National Day Care Study Effects Analyses,* Volume IV-C of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).
3. *Research Results of the National Day Care Study,* op. cit.
4. Ibid.
5. *National Day Care Study Effects Analyses,* op. cit.
6. *Research Results of the National Day Care Study,* op. cit.
7. V. C. Shipman, ed., *Disadvantaged Children and Their First School Experiences,* Educational Testing Service – Head Start Longitudinal Study Technical Report (Princeton, NJ: Educational Testing Service, 1972).
8. To see this point more clearly, consider the following schematic diagram:



The diagram shows the proportion of an average child's time that is devoted to a representative desirable or mature form of behavior (e.g., cooperation) as a function of group size and child age. For both three- and four-year-olds, prevalence of the behavior declines as group size grows. For any given group size, four-year-olds show more of the behavior than three-year-olds. Setting a uniform group size limit (e.g., at point A) will tend to increase the prevalence of the behavior for both age groups. In order to produce equal proportions of the behavior among children of both ages, a more stringent regulation is needed for three-year-olds than for four-year-olds. (For example, to achieve proportion P, group size can be set at B for four-year-olds but must be set at A for three-year-olds.) However, there is no obvious reason why regulatory policy should attempt to offset developmental differences in this manner – and to do so requires increasing the complexity of regulations, monitoring procedures and reimbursement formulae (see Chapter Eight). As long as group size is set at a sufficiently stringent level for both age groups, it is possible to improve the quality of the day care experience (on these behavioral dimensions) for *both* three- and four-year-olds, relative to the quality of experience promoted by current regulations.

If effects were stronger for three-year-olds than for four-year-olds (if the lower line in the figure were more steeply sloped than the upper line), a case could be made for differential requirements by age. Under these circumstances, a given increment in stringency of regulations (e.g., from group size limits of 14 to 12) would produce a larger increase in quality for younger children than for older children. The increment in cost entailed by the change would be the same for both age groups. The increased cost might be justified for three-year-olds but not four-year-olds because of the differential increase in quality. Thus it is important that NDCS results give no indication that such differential effects exist.

9. The Atlanta Area Technical School (AAT) offers a two-year program in child development, a joint program with Atlanta Junior College in child development, and several short-term courses of study. The two-year program is designed to prepare students for employment in day care centers, in kindergartens, pre-kindergartens, nursery schools and special education programs. The school enrolls twenty full-time day students in the program each quarter; in addition, there are usually between fifty and sixty part-time students enrolled in evening

programs, which cover the same subject matter as the full-time courses but enable students to complete their studies over a longer period of time.

During the first two quarters in the program, students receive classroom instruction in various areas related to child development. In the third quarter they gain practical experience working in a Child Development Laboratory (day care center) operated by the school for children between two months and five years of age, returning the following quarter for additional classroom instruction. The final four quarters are devoted to internships in various group situations such as public school kindergarten, private day care, infant care, mixed age groups and programs for handicapped children. A more detailed description of the two-year curriculum is provided in the Table below.

The joint program with Atlanta Junior College (AJC) enrolls both day and evening students. Courses are selected from the AJC catalogue. The program leads to an Applied Science Degree in Child Development and usually takes six or seven quarters to complete.

Curriculum for Two-Year Program at Atlanta Area Tech

Course Title	**Hours**
First Quarter	
Child Growth & Development I	104
Literature for Young Children	52
Creative Activities	104
Music for the Young Child	52
Second Quarter	
Child Development Communication Skills	52
Child Growth and Development II	104
Child Nutrition and Food Preparation	52
Teaching Methods and Materials	104
Third Quarter	
Supervised Student Experience at AAT Child Care Laboratory	312
Fourth Quarter	
Family, Community and Social Problems	104
Day Care Administration and Supervision	104
Human Relations (Child Development)	52
Exceptional Child	52

Fifth Quarter	
Intern at AAT Child Care Laboratory	312
Sixth Quarter	
Intern in Agency I	312
Seventh Quarter	
Intern in Agency II	312
Eighth Quarter	
Work Experience	312
TOTAL HOURS	2496

The short-term courses provided through AAT are designed to meet Georgia's minimum day care licensing standards. The standards require that all persons working in day care classrooms complete a basic child care course during their first three years of employment. "Basics I," which has 60 hours of instruction, provides an overview of day care; "Basics II," with an additional 30 hours of instruction, covers child guidance techniques. The school also offers short-term courses in Family Day Care (30 hours) and Day Care Administration and Supervision (104 hours). Courses may be taught off-campus (e.g., at one or more day care centers) if twelve or more students are enrolled. A certificate of attendance is awarded upon completion, but the courses do not carry credit towards either the two-year or the joint program.

CHAPTER SEVEN: LINKS BETWEEN POLICY VARIABLES AND MEASURES OF COST

1. NDCS cost findings appear in more detail in C. Coelen, F. Glantz and D. Calore, *Day Care Centers in the U.S.: A National Profile 1976-1977*, Volume III of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1978); and D. Calore, "A Simulation Model of Regulatory Impacts on the Day Care Industry in the United States," in *National Day Care Study Effects Analyses*, Volume IV-C of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).
2. *National Day Care Study Effects Analyses*, op. cit.
3. Coelen, Glantz and Calore, op. cit.
4. Ibid.

5. Differences in resource cost are largely due to differences in donated resources. The actual cash difference is only $31 per month per child, due principally to higher wage rates and more noncaregiving personnel in publicly funded centers.

6. *National Day Care Study Measurement and Methods*, Volume IV-B of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).

7. See for example R. Ruopp et al., *A Day Care Study Guide for Administrators, Teachers, and Parents* (Cambridge, MA: MIT Press, 1973); W. Prosser, *Day Care in the Seventies: Some Thoughts* (Washington, D.C., Office of Economic Opportunity, no date); D. Ogilvie, *Estimated Cost of the Federal Day Care Requirements* (Washington, D.C.: Inner City Fund, 1972); and J. Bedger et al., *Findings: Day Care Cost Analysis Project* (Chicago: Council for Community Services in Metropolitan Chicago, 1976).

8. D. Calore, op. cit.

9. For a description of the on-site survey, see Coelen, Glantz and Calore, op. cit.

10. Based on data from Coelen, Glantz and Calore, op. cit.

11. B. Johnson, "Women Who Head Families," in *Monthly Labor Review*, Vol. 101, February 1978, p. 37.

12. *National Day Care Study Effects Analyses*, op. cit.

CHAPTER EIGHT: IMPLICATIONS FOR REGULATIONS AND ADMINISTRATIVE PRACTICES

1. C. Coelen, F. Glantz and D. Calore, *Day Care Centers in the U.S.: A National Profile 1976-1977*, Volume III of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1978).

2. U.S. Department of Health, Education and Welfare, Social and Rehabilitative Service, Public Services Administration, *A Guide for Monitoring Out-of-Home Child Day Care Services*, 1976.

3. *Research Results of the National Day Care Study*, Volume II of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).

4. *National Day Care Study Effects Analyses*, Volume IV-C of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).

5. Coelen, Glantz and Calore, op. cit.
6. It is clear that inconsistent regulations set up a series of economic incentives primarily derived from variation in staff/child ratio.
7. Coelen, Glantz and Calore, op. cit.
8. D. Connell et al., *Center Day Care for Infants and Toddlers: An Exploratory Policy Study*, Volume IV-D of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).
9. Coelen, Glantz and Calore, op. cit.
10. Ibid.
11. Ibid.
12. Ibid.
13. Ibid.
14. Ibid.

COMMENTARY: THE NATIONAL DAY CARE STUDY FROM THE PERSPECTIVE OF BLACK SOCIAL SCIENTISTS

1. See R. Millett and A. Mathis, "The National Day Care Study from the Perspective of Black Social Scientists: Reflections on Key Research Issues" in *National Day Care Study Background Materials*, Volume IV-A of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1978). This paper, by Ricardo Millett and Arthur Mathis, both senior social scientists at Abt Associates, contains, in its appendices, reprints of Task Force memoranda, reports and important correspondence. Both the *Commentary* and the complete report upon which it is based have been reviewed by the Task Force and reflect the consensus of its members: Robert Bland, Virginia Burke, Jean Carew, Asa Hilliard, Harmon Walker and James Young.
2. Millett and Mathis, op. cit.
3. Ibid.
4. Ibid.
5. Ibid.
6. See Cooperative Tests and Services, *Preschool Inventory Handbook*, revised edition (Princeton, NJ: Educational Testing Service, 1970).

7. D. R. Walker, M. J. Bane and T. Bryk, *The Quality of the Head Start Planned Variation Data* (Cambridge, MA: Huron Institute, 1973).

8. L. E. Gilbert and V. C. Shipman, *Preschool Inventory*, Educational Testing Service – Head Start Longitudinal Study, Technical Report No. 18, in V. C. Shipman, ed., *Disadvantaged Children and Their First School Experiences* (Princeton, NJ: Educational Testing Service, 1972).

9. See Walker, Bane and Bryk, op. cit.

10. See V. C. Shipman, J. D. McKee and B. Bridgeman, *Stability and Change in Family Status, Situational and Process Variables and Their Relationship to Children's Cognitive Performance* (Princeton, NJ: Educational Testing Service – Head Start Longitudinal Study, 1976).

11. See Millett and Mathis, op. cit.

12. See V. C. Shipman and M. Tanaka, *Revised Adaptation of the Peabody Picture Vocabulary Test* (Princeton, NJ: Educational Testing Service, 1971).

13. A 32-item version of the PPVT appears in V. C. Shipman, *Revised Adaptation of the Peabody Picture Vocabulary Test* (Princeton, NJ: Educational Testing Service, 1972).

14. J. A. Meissner, V. C. Shipman and L. E. Gilbert, *Peabody Picture Vocabulary Test*, Educational Testing Service – Head Start Longitudinal Study, Technical Report No. 15, in V. C. Shipman, ed., op. cit.

15. See R. Goodrich and J. Singer, "Cognitive Change in the National Day Care Study," in *National Day Care Study Effects Analyses*, Volume IV-C of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).

16. See Millett and Mathis, op. cit., Chapter 2.

17. See D. K. Walker, *Socioeconomic Measures for Preschool and Kindergarten Children* (San Francisco, CA: Josey-Bass, 1973).

18. See E. Prescott, *Training Manual: Prescott-SRI Child Observation System* (Menlo Park, CA: Stanford Research Institute, 1976); and E. Prescott et al., *Assessment of Child-Rearing Environments* (Pasadena, CA: Pacific Oaks College, 1975).

APPENDIX B: THE INFANT/TODDLER STUDY

1. See D. Connell et al., *Center Day Care for Infants and Toddlers: An Exploratory Policy Study,* Volume IV-D of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1979).

2. See A. K. Clarke-Stewart, *Child Care in the Family: A Review of Some Propositions for Policy* (New York: Academic Press, 1977); S. Fraiberg, *Every Child's Birthright: In Defense Of Mothering* (New York: Basic Books, 1977); E. Hock, *Alternative Approaches to Child Rearing and Their Effects on the Mother-Infant Relationship,* Final Report (Washington, D.C.: Department of Health, Education and Welfare, Office of Child Development, 1976); J. Kagan, "The Effect of Day Care on the Infant," paper prepared for the Department of Health, Education and Welfare, Office of the Assistant Secretary for Planning and Evaluation, 1976; W. J. Meyer, *Staffing Characteristics and Child Outcomes,* prepared for the Department of Health, Education and Welfare, Office of Assistant Secretary for Planning and Evaluation, 1976; E. Zigler and S. Hunzinger, "Day Care Policy: Some Modest Proposal," *Day Care Today* (May/June 1977).

3. U.S. Department of Labor, Employment Standards Administration, Women's Bureau, *Working Mothers and Their Children.* (Washington, D.C.: U.S. Government Printing Office, 1977), p. 5.

4. See C. Coelen, F. Glantz and D. Calore, *Day Care Centers in the U.S.: A National Profile 1976-1977,* Volume III of the Final Report of the National Day Care Study (Cambridge, MA: Abt Associates Inc., 1978).

5. See J. V. Carew, "Experience and the Development of Intelligence in Young Children at Home and in Day Care," Monographs of the Society for Research in Child Development, 1978 (in press); M. M. Cochran, *A Comparison of Nursery and Non-Nursery Childrearing Patterns in Sweden,* unpublished dissertation (University of Michigan, 1973); M. Golden et al., *The New York City Infant Day Care Study Instruments* (1973) (New York: Medical and Health Research Association of New York City, Inc., 1978).

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6. Three clusters of centers were found with regard to two-year-old age groups. In the first cluster (40%), children were grouped by ages 18 to 30 months and 30 to 42 (or 48) months. The second cluster (50%) had a single group 24 to 36 months of age, and the third cluster (10%) provided for all three age groupings (18-30, 24-36, 30-42/48 months). Centers in the second cluster frequently maintained overlapping age groupings by providing a 30- to 48-month classroom as well.